



# THE IMPACT OF KNOWLEDGE

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CGIAR Centers ■ CIAT: Centro Internacional de Agricultura Tropical (International Center for Tropical Agriculture), Colombia; CIFOR: Center for International Forestry Research, Indonesia; CIMMYT: Centro Internacional de Mejoramiento de Maiz y Trigo (International Center for the Improvement of Maize and Wheat), Mexico; CIP: Centro Internacional de la Papa (International Potato Center), Peru; ICARDA: International Center for Agricultural Research in the Dry Areas, Syria; ICLARM: International Center for Living Aquatic Resources Management, The Philippines; ICRAF: International Centre for Research in Agroforestry, Kenya; ICRISAT: International Crops Research Institute for the Semi-Arid Tropics, India; IFPRI: International Food Policy Research Institute, United States; IITA: International Institute of Tropical Agriculture, Nigeria; ILRI: International Livestock Research Institute, Kenya; IPGRI: International Plant Genetic Resources Institute, Italy; IRRI: International Rice Research Institute, The Philippines; ISNAR: International Service for National Agricultural Research, The Netherlands; IWMI: International Water Management Institute, Sri Lanka; WARDA: West Africa Rice Development Association, Côte d'Ivoire

**K**nowledge, developed by CGIAR scientists and their partners, ripples outward in every direction, improving the way poor farmers grow their food and achieve better livelihoods. The spread of CGIAR knowledge has a powerful impact on reducing poverty and hunger throughout the developing world. 

## Message from the Chairman Ismail Serageldin

### *Shaping Our Future*

The CGIAR is now poised to redouble its efforts to ensure that our effectiveness in the future will make a difference between despair and hope for the millions now unreached by the dazzling advances of our times.

**T**he future beckons. The closely connected problems of poverty, hunger, environmental distress, and population growth press upon us. They have been held at bay by past efforts and successes but are not gone. During the period covered by this report, therefore, a critical preoccupation of the CGIAR has been the question of how best to reposition ourselves for the future. We have sought to shape our approach and define our strategy within the parameters outlined by the third System Review of the CGIAR, under the chairmanship of Maurice Strong.

The System Review commended the accomplishments of the CGIAR system. We appreciate that ringing endorsement. But institutions do not thrive solely on their laurels. So the CGIAR is challenged to rethink its role(s) and re-design its strategy: to build on past achievements but confront past weaknesses as well.

We made a useful start at International Centers Week (1cw98), scrutinizing the 29 recommendations and 126 sub-recommendations of the System Review in a spirit of openness, candor, and self-assessment. We agreed on some issues. Others that needed further elaboration were divided among various components of the CGIAR system for study and comment. They were then re-examined by the Consultative Council (established at 1cw98), which for-

mulated recommendations for decision by the CGIAR membership as a whole.

The CGIAR is now poised to redouble its efforts to ensure that our effectiveness in the future will make a difference between despair and hope for the millions now unreached by the dazzling advances of our times.

Let me briefly review some of the challenges and opportunities that lie ahead.

**Science.** Scientific excellence and credibility are the defining strength of the CGIAR system. Thus, the System Review noted, the future effectiveness of the system lies in “nurturing scientific credibility, building scientific strengths, and mobilizing scientific partnerships to meet the goals of eliminating poverty and hunger and protecting the environment.” The CGIAR system has to position itself “at the core of a scientifically credible network of partners” and “serve as the flagship of a global movement of science for sustainable food security and poverty eradication.”

Most elements of the Integrated Gene Management and the Integrated Resource Management approaches suggested by the System Review represent an acceleration and intensification of research directions that the CGIAR has followed in recent years. We need to intensify our efforts to integrate crop-specific



research, which has been so successful in the past, into a broader, more holistic vision that encompasses the concept of sustainability and that looks to achieving results through increasing the productivity and profitability of complex farming systems at the small-holder level. Doubling the yields of complex farming systems in an environmentally positive manner is a challenge that will not be easy to meet. But without daunting challenges, science dies.

We need, as well, to harness the benefits of the genetic revolution. We must utilize the most cutting-edge work associated with genetic mapping, molecular markers, and biotechnology to accelerate the breeding process and achieve the promise of all that science can do for the poor and the environment. The revolution in the biological sciences has both promise and pitfalls. We must find ways of realizing the promise while avoiding the pitfalls.

Issues of ethics, safety, and patenting all remain to be further explored and resolved. The deadlock at the recent effort in Cartagena to craft a binding protocol on biosafety, and the legal challenge before the American courts to the fundamental premise of the biotechnology industry, the patentability of modified plants, attests to the complexity of these issues.

The responsibility of confronting the challenges now shifts very much to CGIAR Centers, which must contend with a variety of practical realities arising

from the twin commitment to IGM and IRM, as well as with a slew of other issues, such as the basis of an intensified research effort in Africa, gender-related questions, policy research, and the appropriate means of both benefiting from and influencing the vast array of opportunities inherent in rapid changes in communication technology.

But the Centers cannot act alone. The agricultural research enterprise, if it is to be fully effective as a tool of development, must involve all the actors in this domain. Each has a distinctive contribution to make. All must be linked to a common purpose, in a true coalition of the caring.

**Partnerships.** This principle of research partnerships was unequivocally endorsed at the CGIAR Ministerial-level Meeting in Lucerne (February 9–10, 1995) and has been a strong impulse in all our activities since then. The nongovernmental organizations (NGOs) and private sector partnership committees that we have created are a manifestation of that impulse. We expect to add a long overdue third committee for partnership with national and international science organizations.

Meanwhile, the Global Forum, established with the encouragement of the CGIAR, brings together all the elements of the global agricultural research system. National agricultural research systems (NARS),



advanced research institutions (ARIS), the international Centers, the private sector, NGOs, national and international institutions, and regional and local organizations are all accommodated within the Global Forum. It is the only organization of its kind, and the CGIAR has a central role to play within this global construct.

The partnership committees of the CGIAR were intended to serve two purposes: to strengthen decision-making in the CGIAR with perspectives and experience from beyond the system and to explore the means by which partnerships could make agricultural research more effective.

The first of these objectives has been met. The quality of dialogue between our partners and ourselves has improved immensely. We have benefited from the wisdom of the civil society and the private sector. We have gained new insights into their experience and modes of operation. We trust that they have gained from their relationship with us. Certainly, a strong and discernible sense of mutual respect has been forged and is continuously being strengthened.

Fulfillment of the second objective is a continuing process. We know already that:

- linkages are most effective when they serve as conduits for two-way communication based on mutual respect and a sense of commonality;

- science and research must always be at the core of partnership mechanisms; and

- the overriding aim of partnerships must be to combine forces to ensure that the best of science is mobilized in practical ways on behalf of the world's poor and disadvantaged.

On the basis of that knowledge, and with the results of an anticipated study of partnership experience, we can move into new areas of cooperation. Rules of engagement are yet to be crafted in a number of areas, particularly those dealing with various aspects of proprietary sciences. We must dare to be bold as we seek the most efficient ways of making partnerships work.

**Governance.** The informality of our system of governance is envied by many external observers. Efforts have been made to replicate the arrangements under which the CGIAR does business, but imitations—though flattering—have never been an exact replication of the original.

Nevertheless, we have at various times noted weak points in the system and have grappled with the issue of how to improve governance without letting go of the fundamental principles on which CGIAR governance is based. Improved decision-making processes, for example, have been a long-sought goal of the CGIAR. Several experiments have been tried over

the years, and the system has shown a consistent interest in making further improvements.

The System Review dealt with many of these issues and made a number of proposals, including the creation of a Central Board with access to funds, power to act on behalf of the CGIAR, and a chief executive. In addition, the System Review recommended that the CGIAR be incorporated as a legal entity, thus eliminating its informal nature. These far-reaching proposals were viewed as potentially damaging to the core, collegial values of the CGIAR.

The principle underlying the proposals—namely, that “business as usual” is not tenable—remains valid. The CGIAR endorses the need to make improvements, to streamline decision making, and to increase openness across the system. Several mechanisms are therefore being re-examined and, as appropriate, restructured. The Consultative Council established at ICW98 to further review System Review recommendations on behalf of the full membership proved its effectiveness as facilitator of decision making. Establishment of a council akin to the ICW98 creation as a permanent unit will be a giant step forward.

**Finance.** Initiatives and innovations arising from the System Review will require sustained financial support. For this, the CGIAR will have to meet a number of goals, such as:

- ensuring increased ODA for the CGIAR and its NARS partners;
- leveraging the CGIAR's small contribution to global research efforts;
- maintaining a North-South balance in funding of and influence on the research agenda; and
- ensuring predictability and stability of funding, rational resource allocation, restricted versus unrestricted funding, and disbursement practices of donors.

To reach these goals, the CGIAR needs a multi-faceted, resource mobilization strategy for tapping both traditional and new funding sources (both from the public and private sectors, including corporate philanthropy); effective financial management, at both the system and Center levels, for supporting the agreed-on research agenda, which includes strategic system-level initiatives; and action to cope with the volatility of the external financial environment.

CGIAR finances are currently stable, but nothing can or should be taken for granted.

**Moving Ahead.** The challenges and the opportunities ahead are substantial. We have to produce more food but produce it differently ... to grow more sheaves where only one grew before but to do so in a manner that does not despoil the land on which the crops multiply or diminish the water that sustains them. To meet this challenge, we must ceaselessly examine the

effectiveness of our science, the vigor of our partnerships, and the adequacy of our support for agricultural research.

We are living in a time unmatched for the opportunities that it provides the biological sciences. It is an exhilarating time, similar to what the field of physics experienced in the glorious 40 years between 1905 and 1945, when all the concepts were changed, from cosmology to quantum physics, from relativity to the structure of the atoms. Today we are decoding the very blueprints of life; we are learning to manage the deployment and expression of genes.

And so, as I said at the beginning of this message, the future beckons. Let us move forward to meet it.

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## Overview from the Executive Secretary Alexander von der Osten

Strong developing country membership not only brings an invaluable perspective to CGIAR deliberations but also helps ensure an equitable balance in CGIAR decision making.

For the CGIAR, 1998 will be best remembered for the third System Review, an assessment of the CGIAR's accomplishments during more than a quarter century and a compass for the future. The review panel—a distinguished group of independent experts led by Maurice Strong—paid tribute to former and current CGIAR members, scientists, collaborators, and staff by endorsing the work of the CGIAR and concluding that the CGIAR has been and will continue to be an extraordinary resource for agricultural knowledge to benefit the world's poorest people. The review invigorated the efforts of the CGIAR to play a leading role in agricultural research in the next century.

The review also emphasized the power of agricultural knowledge to help solve global food security, poverty, and environmental problems, a recurring theme throughout these pages. One prominent example of this knowledge is the “green revolution,” which CGIAR scientists helped fuel. The green revolution transformed agriculture, particularly in Asia and Latin America. Millions were fed, and the very real threat of famine was thwarted.

Over the years, however, some concerns have been expressed about the environmental aspects of accelerated productivity and about problems of distributive justice even when high productivity has been achieved. The System Review therefore urged that in

the new millennium the CGIAR should re-commit itself to champion the poor and the environment. This calls for research initiatives by national and international scientists that will contribute to environmentally sound management of natural resources, as well as to promotion of socio-economic equity.

To that end, the review panel offered 29 recommendations on CGIAR science, governance, partnership, and finance issues. Several of the recommendations were adopted at ICW98. A consultative council reflecting the CGIAR membership has been examining other recommendations, which will be considered at the 1999 mid-term meeting.

Aside from the third System Review, 1998 was an exciting and productive year in many other ways:

**Strengthened Developing Country Participation and Support.** Uganda joined the CGIAR in 1998, bringing the total number of CGIAR members to 58, including 22 developing and transition economies and 21 developed nations. Strong developing country membership not only brings an invaluable perspective to CGIAR deliberations but also helps ensure an equitable balance in CGIAR decision making. Colombia increased its contributions to \$3 million a year for the next five years, a greater commitment than that of many richer countries. Kenya enhanced its collaboration with the CGIAR by using a World Bank loan to support agricultural research, includ-



ing that by the CGIAR. This act was solid confirmation that the CGIAR is a sound investment.

**Research.** A phase of consultation and policy formulation concerning biotechnology that began at a stakeholders meeting in April 1997 was completed in 1998. The CGIAR acknowledged the potential importance of biotechnology as an instrument to help the poor and the environment but concluded that it is not a “magic bullet.” The CGIAR decided that the Centers’ work on biotechnology will be conducted within the confines of agreed-upon ethical principles, with necessary precautions to ensure safety. It also clarified its stand on and the Centers’ current practices with respect to genetic resource management, collaboration with the private sector, patenting, and other important issues.

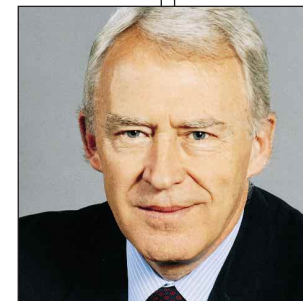
**Evaluation and Impact Assessment.** External program and management reviews of CIMMYT, CIFOR, ICRAF, IFPRI, and IRRI as well as the systemwide program on genetic resources were conducted. The Impact Assessment and Evaluation Group, which has succeeded in instilling an evaluation culture in the CGIAR, will link its *ex post* evaluation work with the Technical Advisory Committee’s overall priority setting and evaluation functions.

**Communications and Outreach.** The third System Review emphasized the need for strengthened CGIAR public information activities. In 1998, the

Secretariat began consolidating its efforts, producing new public awareness materials, launching a concerted media outreach program, improving the CGIAR website, and reaching out to target audiences (including the World Bank). The Chairman played a strong leadership role, representing the CGIAR at a variety of international, national, and regional fora and hosting informal briefings for leading journalists that have produced excellent results. A new Center public awareness initiative, Future Harvest, was launched in 1998.

**Finance.** Funding for the CGIAR’s research grew from \$320 million in 1997 to \$340 million in 1998. Despite the uncertainty of the global financial environment, nearly all CGIAR Centers were fully funded in 1998. Because the overall ODA climate is difficult, assuring adequate resources for Center programs remains a challenge.

We enter 1999 with renewed conviction and determination, proud of our past accomplishments and confident that we can meet the challenges of the new millennium. The momentum of the third System Review and the dedicated commitment of our members will strengthen our efforts in 1999.



## CGIAR at a Glance

Agriculture is the cornerstone of development in poor countries. But agricultural growth must be achieved through methods that preserve the productivity of natural resources. Research is one key means by which the world's knowledge of agriculture is increased and improved.

**T**he CGIAR is a global agricultural research network—the largest scientific partnership in this field. Established in the early 1970s, the CGIAR works to promote food security, poverty eradication, and the sound management of natural resources in the developing world. It pursues these objectives through the diverse activities of 16 international research Centers located throughout the world and a small secretariat located in the World Bank in Washington, D.C.

CGIAR members—58 industrial and developing countries, private foundations, and regional and international organizations—provide financial assistance and technical support. A host of other public and private organizations work with the CGIAR as donors, research partners, and advisors.

Agriculture is the cornerstone of development in poor countries, where more than 70 percent of people depend on the land for their livelihood. But agricultural growth must be achieved through methods that preserve the productivity of natural resources. Research is one key means by which the world's knowledge of agriculture is increased and improved. CGIAR Centers conduct research on food crops, forestry, livestock, irrigation management, aquatic resources, and other areas in collaboration with many partners.

The CGIAR's research agenda focuses on five principal challenges:

**Increasing Productivity.** The CGIAR strives to make the agriculture of developing countries more productive through genetic improvements in plants, livestock, fish, and trees and through better management practices. One important focus of the CGIAR's productivity research is increasing plants' resistance to insects and diseases that adversely affect productivity and the stability of production in the tropics. While protecting farmers from losses, these improved plants protect the environment because they require few, if any, chemical inputs.

**Protecting the Environment.** Conserving natural resources, especially soil and water, and reducing the impact of agriculture on the surrounding environment is an essential and growing part of research efforts. The CGIAR plays a leading role in identifying and promoting sustainable agricultural ecosystems and in developing solutions to pressing environmental problems.

**Preserving Biodiversity.** The CGIAR holds in trust one of the world's largest *ex situ* collections of plant genetic resources, containing more than 600,000 accessions of more than 3,000 crop, forage, and pasture species. The collection includes improved varieties and, in substantial measure, the wild species from which those varieties were created. Duplicates of these materials are freely available to researchers around the world so that new gene combinations can

be brought to bear on current problems. The CGIAR was the first organization to place its collections under the auspices of the Food and Agriculture Organization of the United Nations (FAO) as the basis of an international network of *ex situ* collections.

**Improving Policies.** Agricultural production and natural resource management are heavily influenced by public policy. The CGIAR's policy research aims to help streamline and improve policies that strongly influence the spread of new technologies and the management and conservation of natural resources.

**Strengthening National Research.** The CGIAR supports national agricultural research in developing countries through collaborative work with colleagues in national programs, strengthening of skills in research administration and management, and formal training programs for research staff.

The CGIAR conducts research on almost 30 food commodities and dozens of ecosystems. Such investments have consistently paid handsome dividends:

- More than 80 percent of wheat produced in developing countries is CGIAR-related varieties; the additional output is valued at US\$1.8 billion annually.
- Internationally, some 300 million hectares of ecologically fragile land have been saved through intensive use of new technologies pioneered by the CGIAR. This area is equivalent to all the arable land in the United States, Canada, and Brazil combined.

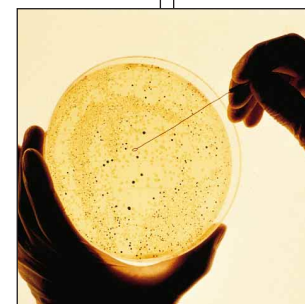
- More than 90 percent of irrigated rice production in Latin America can be traced to varieties introduced with help from the CGIAR. Market prices have been cut in half during three decades, and consumers have benefited by more than US\$500 million.

- Maize production in West and Central Africa rose more than three-fold between 1981 and 1996 through planting of new high-yielding, early maturing varieties developed by the CGIAR. The increased production is sufficient to feed 40 million people annually and represents a value of US\$1.2 billion.

- Fresh water fish production in Asia has increased dramatically through the CGIAR's development of improved strains of tilapia, a hardy species that grows 60 percent faster than other farmed strains.

- Pesticide use in developing countries has been reduced substantially through the introduction of integrated pest management and biological control methods. The CGIAR's success in controlling the cassava mealy bug alone has added more than US\$400 million annually to output in sub-Saharan Africa.

The CGIAR's research budget for 1998 was US\$340 million. The World Bank, the FAO, the United Nations Development Programme (UNDP), and the United Nations Environment Programme (UNEP) are cosponsors of the CGIAR.



A world map with a dark blue background and yellow outlines of continents. Numerous white dots are scattered across the map, representing city locations. Several specific locations are labeled in red text: CIMMYT (Central America), IFPRI (East Africa), ISMAR (Europe), IPGRI (East Asia), CIAT (South America), CIP (South America), IITA (West Africa), and WARDA (West Africa).

# CGIAR Impact Worldwide

16 Research Centers

58 Members

127 Outreach Offices


Placements of markers are approximate and  
indicate city locations, not individual offices.









**N**ew scientific discoveries are founded upon knowledge that has endured. For nearly 30 years, the CGIAR has generated and shared a wealth of knowledge. This knowledge has been used to catalyze scientific innovations to solve urgent food and environmental problems. 

## CGIAR: Knowledge Catalyst for Development

The CGIAR is well-known for the instrumental role it played in sowing the seeds of the “green revolution.” No story better illustrates how new knowledge can serve to alleviate hunger and poverty and how long-term public goods research can create economic and social value.

**T**he developing world today is in a far better food security position than it has been at any time in the 20th century. More than half of the 80 percent increase in world-wide food output since the early 1970s has accrued in developing countries. Per capita caloric consumption has increased 26 percent over the same period, bringing numerous improvements in health, nutrition, and life expectancy. And the number of people eating fewer than 2,100 calories a day, a standard index of malnutrition, has fallen by three-quarters.

Such an achievement is attributable to many factors, including increased investments in agricultural inputs and irrigation, more effective farm extension, and improved government incentives. But the critical contribution that advances in scientific knowledge have played cannot be overstated.

The CGIAR is well-known for the instrumental role it played in sowing the seeds of the “green revolution,” the adoption of new plant varieties, agricultural know-how, and technologies that helped to double grain harvests in the developing world in just a few decades. No story better illustrates how new knowledge can serve to alleviate hunger and poverty and how long-term public goods research can create economic and social value.

Since its early years, the CGIAR has generated new agricultural knowledge through cutting-edge research.

It has served as a knowledge catalyst—facilitating the learning and adaptation of new agricultural science and technology in the developing world through a strong field presence and solid working partnerships with national research institutions.

Once new knowledge was absorbed, second-generation varieties were successfully adapted to local conditions. Indeed, improved scientific capabilities in developing countries led to a doubling of the release of new rice and maize varieties between 1966 and 1985. These improved seeds reached the fields of millions of farmers through the efforts of newly trained researchers, science educators, and extensionists in developing countries—50,000 of whom were trained at CGIAR Centers.

**Evolving Role, Steadfast Objectives.** The constellation of forces driving agricultural progress around the world is changing rapidly. When the agenda of the CGIAR first took shape in the early 1970s, the public sector dominated agricultural research and development in both the North and the South. The generation of new science influencing farming and farm systems was the domain of public and academic institutions in the developed world.

As the CGIAR and its partners enter the 21st century, they face the urgent need to increase agricultural production for a growing world population in



Rice is the staple food for nearly 3 billion people. By 2025, that number will be a staggering 4.6 billion, and nearly twice as much rice will have to be harvested to feed these people.

the context of three important developments. The first is the paradigm shift taking place in the agricultural sciences due to tremendous advances in genetics and in agro-ecological systems management. The second is the rapid growth of global communications; capabilities have expanded exponentially with the advent of the Internet, e-mail, and other digital technologies. The third is the emergence of proprietary science, which has assumed a major role in critical areas of agricultural research as a result of billions of new private investment dollars each year.

These developments come as no surprise. Over the last two decades, the CGIAR has steadily expanded

### SINGER: First Global Genetic Resources Database

The System-wide Information Network for Genetic Resources (SINGER) is the genetic resources information exchange network of the CGIAR. It provides access to information about the collections of genetic resources held by the CGIAR Centers. Together, these collections comprise more than half a million samples of crop, forage, and tree germplasm of major importance for food and agriculture. In addition, the CGIAR holds a small collection of fish germplasm for research purposes.

SINGER allows searches for information relating to the identity, origin, characteristics,

and distribution of the genetic resources in the individual Center collections and access to further specific data on the collections—for example, crop characterization data. To ensure optimum conservation and use of the collections, the Centers have developed computerized databases that contain records of the identity, origin, morphological and other characteristics, storage, and distribution of each sample held.

The collections represent insurance against genetic erosion as well as sources of tolerances to diseases, pests, and climatic and other environmental stresses, and of improved agricultural quality and productivity. In 1994, the collections

were placed in trust for the world community under the authority of the FAO. Under that agreement, the materials are maintained in conditions that meet international technical standards and are made available without restriction for research, breeding, and conservation.

SINGER is a project of the CGIAR System-wide Genetic Resources Programme, which was established to draw together the activities and strengths of the individual Centers and to enhance the CGIAR's contribution to the implementation of the Convention on Biological Diversity.

### CGIAR: Pioneer of Global Knowledge Networks

Sharing knowledge about agricultural development has long been one of the CGIAR's most important functions. It was one of the first development institutions to invest in computer-based communication technology linking scientists in developed and developing countries through a global electronic network.

The CGIAR's first attempts at linking scientists and collaborators began in the late 1970s with a rudimentary system of packet switching, involving the rapid transmission of data in condensed form over telephone lines. The CGIAR's partnership with CGNET Services International, a private company dedicated to promoting con-

nectivity, is a remarkable example of the power of electronic communication, computer networking, and collaboration between publicly funded development institutions and the business sector. From modest beginnings in 1983, CGNET now links more than 300 CGIAR sites in more than 100 countries.

The CGIAR shares its communication technologies and links communities that are improving agricultural productivity in some of the world's poorest countries. A few examples illustrate the centrality of electronic networking and knowledge-sharing to the CGIAR's mission and operations:

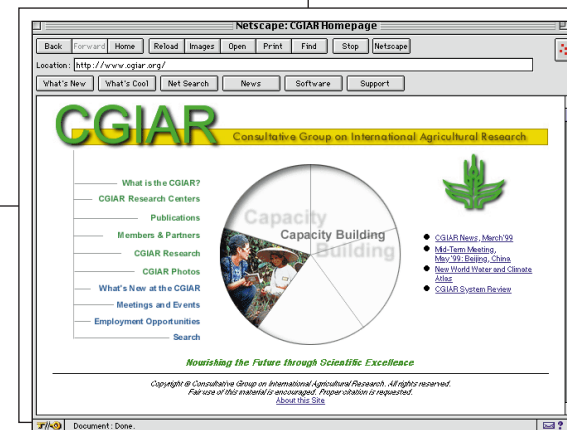
- CGIAR's Integrated Voice and Data Network (IVDN), provides unparalleled communication and

information access by carrying simultaneous streams of diverse digital traffic, ranging from computer data to voice and video. It serves as a worldwide LAN and organizational intranet and provides Internet connectivity.

- The CGIAR became one of the first development organizations on the World Wide Web in 1994; its expanded site ([www.cgiar.org](http://www.cgiar.org)) is visited by about 40,000 people every month.

- CAB Abstracts, a rich database of 3.5 million records, is available on-line.

Taken together, these activities show a knowledge-intensive partnership at work for poor farmers around the world.



[www.cgiar.org](http://www.cgiar.org)

its long-term vision and strategy to foster and assimilate the new agro-ecological paradigm—increasingly incorporating forestry, agro-forestry, water management, fisheries management, and aquatic resources management into its operational agenda. It has continually sought to integrate the latest scientific advances into complex farming systems in an environmentally sustainable manner. It has regularly scrutinized its research priorities to ensure that it invests efforts only in those areas where it has a clear comparative advantage. And it has been one of the early adopters of the latest in global communications tools.

But the emerging new reality holds a special irony.



As CGIAR Chairman Ismail Serageldin pointed out recently:

*Just as the informatics revolution is making more information more accessible to more people than ever before, the very nature of the scientific enterprise is changing. More and more, the new breakthroughs in science and technology in domains like informatics and biology are driven by the private sector. The manner in which research is being carried out will make it impossible to practice the open exchange of information and germplasm that have been the hallmark of the past. Clearly, the new world of knowledge-based societies and global linkages is one that will favor the nimble, the educated, and the powerful.*

The CGIAR's special challenge is to help ensure that the best of science continues to be harnessed for addressing the problems of the poor.

**Building Knowledge Partnerships.** A changing operational context requires the CGIAR to redefine and reposition itself. Today, its multiple roles as knowledge creator, facilitator, and catalyst must all be intensified. To maintain access to the best of science and to help transform the crops of the poor in the developing world, national and international agricultural research organizations need to develop new partnerships with the scientific engines in the private



### International Crop Information System

The CGIAR's International Crop Information System (ICIS) is a flexible data management system that enables agricultural researchers worldwide to manage and share data more effectively. The core of ICIS is a relational database that stores data on plant genetic resources, pedigrees, and field and laboratory evaluations, as well as auxiliary data on locations, institutions, and people. A component of ICIS called the Genealogy Management System (GMS) provides pedigrees and selection histories for diverse crops such as rice, maize, and cassava. The Data Management System (DMS) handles

information from field and laboratory studies, including data from formal experiments, survey data, and expert opinion. Any given trait for a crop, such as drought tolerance in maize, can be associated with a full description of the methods used to obtain the data on that particular trait.

ICIS is a collaborative effort involving scientists and programmers from CIAT, CIMMYT, CIP, ICARDA, ICRAF, ICRISAT, IITA, and IRRI.

The ICIS team is working to provide seamless links between ICIS and other information technologies used in agriculture. The CGIAR's Systemwide Genetic Resources Programme has endorsed ICIS as a

critical initiative in the establishment of germplasm information systems. In recognition of the need to link conventional evaluation data to molecular marker data, Australia's Grains Research and Development Corporation is supporting the development of tools for storing and querying marker data within ICIS.

Although ICIS is a "work in progress," it is fully functional. Versions of GMS are now available for rice (IRRI), wheat (CIMMYT), cowpea (IITA), and common bean (CIAT). Detailed information on ICIS is available at [www.cgiar.org/icis](http://www.cgiar.org/icis).

## Global Views of Coral Reefs

High-resolution photography of selected coral reefs was among the many scientific activities undertaken by the crew of the space shuttle Discovery in November 1998. NASA, the U.S. space agency, has already given ICLARM access to its 300,000-plus images of Earth from space. As part of a follow-up assignment, shuttle astronauts have agreed to take new pictures of specific reefs to help enhance ICLARM's geographic information system (GIS) for studying reefs worldwide and augmenting the ReefBase data collection.

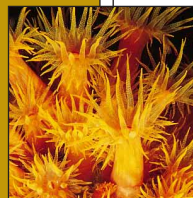
ReefBase is the first global database on coral reefs and their resources. It makes reef information available to a wide audience through user-friendly software on a

CD-ROM and over the World Wide Web to promote awareness and informed management.

ReefBase was created for use by scientists, academicians, students, resource managers in government and private institutions, divers, and other coral reef enthusiasts. It is a key part of research to develop criteria for assessing reef health on national, regional, and global scales. The official database of the Global Coral Reef Monitoring Network, it directly addresses priority actions of the International Coral Reef Initiative, which is endorsed by 75 governments. Reefbase was developed in collaboration with the World Conservation Monitoring Centre, the University of Rhode Island, NASA's Johnson Space Center,

and the National Center for Atmospheric Research. Its Web address is [www.reefbase.org](http://www.reefbase.org).

ReefBase 2.0, an electronic encyclopedia now available on CD-ROM, presents reef information in a relational database designed to accommodate a wide spectrum of references. It includes ecological surveys on benthic and reef fish communities and information on existing stresses on reefs, harvest values for different types of fisheries by reef, coastal tourism, mariculture activities, and oceanography and management practices. Additional features of ReefBase are ECOPATH 3.0 and RAMP (Rapid Assessment of Management Parameters). To order ReefBase, visit [ReefBase@cgiar.org](mailto:ReefBase@cgiar.org).



sector and in advanced research institutions in both the North and South. New research consortia will need to be built that allow proper genetic characterization at the upstream end and development of improved plant species benefiting both the poor and the environment in developing countries at the downstream end.

Given nearly 30 years of leadership in worldwide agricultural research, the CGIAR has a demonstrated ability and special competence to conduct business with both the traditional and new actors in the global research enterprise. It is in a unique position to facilitate and develop new partnerships and new solutions. And it is moving deliberately to become one of the important players in a multi-level, multi-directional, worldwide knowledge exchange that includes the South and the North, the public and private sectors, and (increasingly) NGOs.

The responsibilities of the CGIAR in the new millennium will be numerous and extensive. Among these are facilitating a role for an increasingly powerful and articulate group of NARS through new mechanisms such as the Global Forum, providing a focus for ongoing dialogue between the public and private sectors in both the North and South, emphasizing incorporation of traditional and indigenous knowledge into the highly specialized work of research scientists, and ensuring that im-

portant innovations reach both poor people and poor countries.

In a world where 90 million more people must be fed every year and where many NARS in developing countries are still weak, the CGIAR's sponsorship of and participation in international agricultural research remains essential. There is a strong need to maintain the strength of publicly funded research. And, in a world where the rules of the game have changed and the best of science is no longer freely available, the need for a public-private scientific partnership that creates a "win-win" situation for both sides is paramount.

The CGIAR is engaging constructively with private research institutions, while continuing to strengthen its partnerships with NARS and its collaboration with advanced institutes. It is responding to the many positive and far-reaching recommendations prepared by the System Review Panel. And it is determined to serve as both a leader and a catalyst in ensuring that 21st century knowledge genuinely benefits the poor and the developing world.

### New Atlas Assists Water Crisis Management

Some 80 countries face water shortages today. Within 25 years, one-quarter of humanity is likely to suffer severe water scarcity. This mounting water crisis poses the single greatest natural threat to food security, human health, and environmental balance in the 21st century.

New ways must be developed to better manage water if humanity is to feed itself. IWMI unveiled a powerful new analytical tool in late 1998. The computerized *World Water and Climate Atlas* allows scientists, agronomists, farmers, and specialists in irrigation and weather to extract and analyze key water and climate data on their regions.

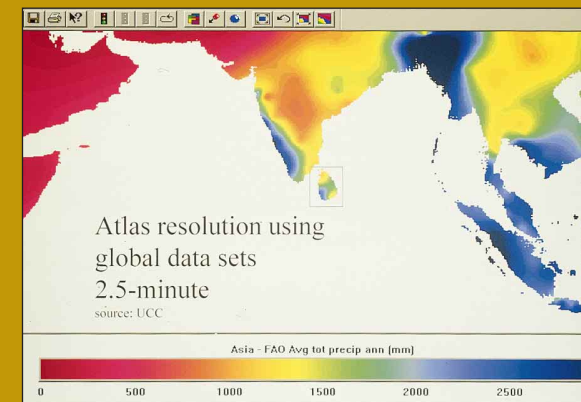
The Atlas represents a major breakthrough in managing use of water for agriculture. Of every five liters of water consumed, four liters are directed to irrigated agriculture, which produces 30–40 percent of all food

crops. As surface water is fully used in the semi-arid regions, groundwater tables are falling at an alarming rate. Moreover, both surface and groundwater are increasingly polluted in many regions.

The Atlas provides professionals with an exact tool for planning irrigation and agricultural development. It displays the temperature, precipitation, and other parameters for single months, crop seasons, and annual periods across the entire globe. It also displays information on population

densities, river basins, vegetative indices, and other factors relevant to management of water for agricultural use.


The Atlas initiative began in 1996 with the goal of assembling climate, water, and natural resources data in a computerized format that could be easily used in GIS studies. It is sponsored by the Japanese government and the U.S. Agency for International Development and is available at the IWMI website ([www.iwmi.org](http://www.iwmi.org)) and on CD-ROM.









Complex human problems require an interconnected set of responses. The CGIAR reaches across disciplines and international boundaries by bringing together public and private partners in an integrated network that meets the challenges of hunger, poverty, and environmental decline. This unique network, this web of partners, is the CGIAR. 



## Assessing System Capabilities for the 21st Century: The Third System Review

Investment in the CGIAR has been the most effective use of official development assistance, bar none. There can be no long-term agenda for eradicating poverty, ending hunger, and ensuring food security without the CGIAR. —*The Third System Review*

A powerful endorsement summarizes the findings of the third System Review of the CGIAR. An independent panel of experts headed by Maurice Strong, chairman of the Earth Council and Secretary-General of the UN Conference on Environment and Development, conducted the assessment during 1997–98. The panel concluded that “no other organization has the credibility to undertake the multiple tasks of scientific research, international negotiation, resource mobilization, and constituent building that are required.”

Initial discussions about organizing a new System Review started in 1995 at a ministerial-level meeting in Lucerne, Switzerland. It had been more than a decade since the last such comprehensive study, and the CGIAR had more than doubled in size, both in terms of budget and membership, since 1981. It had also weathered some difficult financial times in the early 1990s. During that time, the worlds of both agricultural science and communications had experienced virtual revolutions.

What would distinguish the latest System Review from any previous exercise was the boldness, depth, openness, and degree of independence of the evaluation set into motion by Chairman Ismail Serageldin. For the third System Review, the CGIAR would reach back to the roots of its creation and beyond its

traditional collegial confines to seek criticism, perspective, and a vision for the future.

The review panel was made up of eight independent experts from academia, scientific research organizations, government, foundations, nongovernmental organizations (NGOs), and the corporate world. They would be guided by Maurice Strong, who had represented Canada at key meetings in the late 1960s that led to the establishment of the CGIAR.

The panel’s assessment would cover virtually all aspects of the CGIAR’s US\$350 million operation and would emphasize scientific, partnership, governance, and finance issues. Special attention would be paid to the inclusiveness and transparency of the 18-month review process. Panel members would visit all 16 CGIAR Centers and hold formal and informal meetings with a wide spectrum of CGIAR’s stakeholders and partners as well as members of civil society. The System Review Secretariat even set up a website to provide ready access to vital reports of the panel’s meetings.

**Principal Finding: “Extraordinary resource.”** The review panel’s 112-page final report, *The International Research Partnership for Food Security and Sustainable Agriculture*, was presented to CGIAR members at International Centers Week ’98 and disseminated globally to policymakers, NGOs, and the scientific

community. It was also posted on the CGIAR website ([www.cgiar.org](http://www.cgiar.org)).

The panel unanimously concluded that the CGIAR is an “extraordinary resource” for providing agricultural knowledge to improve the lives of the poor and hungry in developing countries. The panel found that the CGIAR has:

- established a universally acknowledged record of success in international agricultural research;
- consistently produced a high rate of return on its investments in agricultural research for developing countries; and
- contributed significantly to increased food supplies and lower food prices through research on high-yielding varieties.

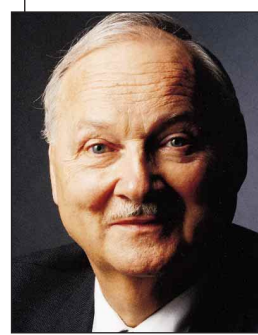
Independent studies confirm that rates of return on investments in agricultural research are consistently high—for example, 191 percent on maize research in South America, 54 percent on rice research in India and Indonesia, 60 percent on cowpea research in Senegal, and 50 percent on wheat research in all developing countries. On the basis of data from 42 developing countries, a CGIAR study determined that a US\$1 increase in agricultural production generated US\$2.32 of growth in the overall economy.

Such successes have been possible because of the CGIAR’s focus on agricultural science, commitment to long-term research, dedication to scientific excel-

lence, and production of agricultural knowledge as an international public good. These strengths were highlighted repeatedly in the review panel’s report.

The panel offered 29 key recommendations with respect to science, governance, finance, and partnerships. Regarding CGIAR science, the panel observed that the revolutions under way in biology and information technology are a cause for both optimism and concern: many of the innovations (especially in biology) are proprietary and are geared toward the needs of the North. A strong system like the CGIAR, which is trusted by both the North and South, is needed to form the scientific and institutional bridges necessary to ensure that the poor will benefit from what science offers for global food security. Although its mission and overall directions are appropriate, the CGIAR must adjust its strategy to take full advantage of opportunities in integrated gene management, integrated natural resources management, and information technology.

The panel praised the CGIAR’s effective and able leadership and efficient management systems. But



**Maurice Strong, Chair  
of the third System Review**

### Third System Review Panel

**Maurice Strong**

Chairman of the Earth  
Council (Canada), Chair

**Bruce Alberts**

President of the National  
Academy of Sciences (USA)

**Kenzo Hemmi**

Professor at Tokyo Eiwa  
Women’s University (Japan)

**Yolanda Kakabadse**

Minister of Environment  
(Ecuador)

**Klaus Leisinger**

Executive Director of the  
Novartis Foundation for  
Sustainable Development  
(Germany)

**Whitney MacMillan**

Former CEO and Chairman  
of Cargill, Inc. (USA)

**Bongiwe Njobe-Mbuli**

Director General for  
Agriculture (South Africa)

**Emil Salim**

Professor of Economics  
(Indonesia)

**M. S. Swaminathan**

Chairman of the M. S.  
Swaminathan Research  
Foundation (India)

**Executive Secretary of  
the third System Review:**  
Mahendra Shah (U.K.)

### A Tradition of Accountability and Learning

The CGIAR has a long tradition of demonstrating accountability to members and stakeholders through external reviews of Centers, systemwide programs, and the CGIAR system as a whole. This deeply embedded culture of assessment helps ensure that cutting-edge science is consistently brought to bear on the problems of poverty, hunger, and environmental degradation in developing countries, the *raison d'être* of the CGIAR. Consequently, members can be sure that contributions of funds are used effectively and are targeted to programs of high priority. Such accountability is critical for the CGIAR because of the autonomous nature of its research Centers and their boards.

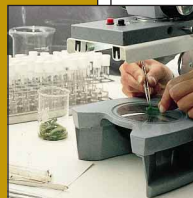
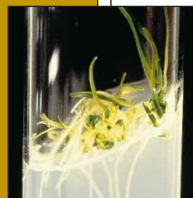
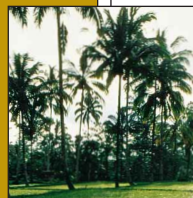
External reviews of Centers involve outside experts commissioned by the Technical Advisory Committee (TAC) for science, the CGIAR Secretariat for finance and management, and the

Impact Assessment and Evaluation Group (IAEG) for *ex post* impacts. These reviews help ensure the scientific quality and effective impact of each Center's work. Interdisciplinary review teams, appointed by TAC in consultation with the CGIAR Secretariat, on average, review each Center once every five years. More than 70 Center reviews have been conducted since the CGIAR was founded. During 1998, five Centers (CIFOR, CIMMYT, ICRAF, IFPRI, and IRRI) and the system-wide program on genetic resources were reviewed. Individual Centers also commission independent reviews.

The first System Review of the CGIAR was conducted in 1975, when the CGIAR had nine Centers, 23 members, and contributions totaling \$47.3 million. The review panel was assisted by a study team directed by Alex McCalla, who was then at the University of California at Davis. The

review panel made 22 recommendations, most of which were adopted with virtual unanimity. The recommendations focused on the need for the CGIAR, the scope of its activities, inter-Center relationships, and the Centers' policies and procedures for long-term planning, program evaluation, fund allocation, and system management.

The second System Review was conducted in 1981 when the CGIAR network had 13 Centers, 32 members, and contributions of \$140 million. An outside study committee directed by Michael H. Arnold of the Plant Breeding Institute in Cambridge, England, assisted the review panel. The panel made 24 recommendations dealing with the work and focus of the CGIAR Centers, collaborations with national agricultural research programs, and the need for strategic research. The vast majority of recommendations were accepted.

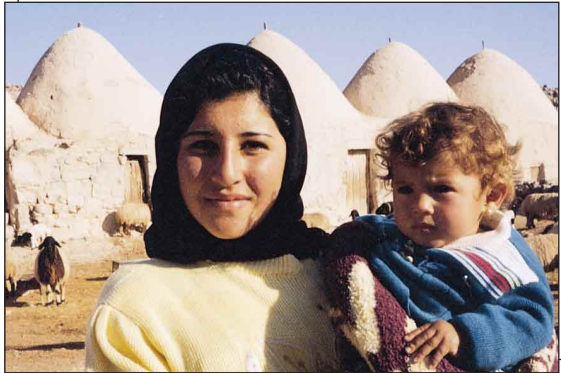


it concluded that the growth of the CGIAR has overstretched the capacities of its informal means of governance. It also noted a need to streamline committees and to introduce a more integrated system-wide decision-making structure.

With respect to finance, the panel recommended that the CGIAR continue to rely on official development assistance as its major source of support. It predicted that partnerships with the private sector will increase, providing new means for financing joint activities.

With respect to partnerships, the CGIAR must work with the World Bank, FAO, and other institutions active in Africa, along with African partner organizations, to enhance food security and sustainable agricultural development in Africa. This continent will require a more focused and integrated research and development effort from the CGIAR and its partners.

**CGIAR Knowledge in a New Context.** More than a billion people live in abject poverty today. Each year the world must feed another 90 million people. Many countries face the prospect of growing water scarcity. Wide-scale environmental degradation continues across much of the developing world. To address these challenges, the review panel said that the CGIAR must effect a “paradigm shift,” turning from productivity-oriented research (its initial task)



ICARDA is working to improve the welfare of people in the dry areas of the developing world through agricultural research aimed at increasing farm productivity while conserving and improving the natural resource base.

to integration of gene management with natural resource management. This change will require the CGIAR Centers, which have long worked on natural resource management and genetic resources, to collaborate with advanced scientific institutions, national agricultural research systems in developing countries, and the private sector to make full use of the powerful new tools offered by molecular biology and to do so with appropriate ethical and biosafety considerations.

In an era of transgenic plants and global geographic information systems, successful and sustainable agriculture has become more and more

### Biotechnology in the CGIAR

In an interview in *Newsweek International* in August 1998, Ismail Serageldin discussed the urgent need to increase agricultural production to feed a burgeoning world population. He reported that biotechnology can be a useful tool to the CGIAR Centers as they pursue food security, as well as poverty reduction and environmental protection. This conclusion is supported by the demonstrated potential of genetic modification to produce plants that can better resist disease and insects, survive with less water, and produce more and higher quality food.

A growing number of scientists in developing countries agree that agribiotechnology, with adequate ethical and safety standards, can be an important tool in efforts to eliminate hunger, as well as poverty. This promising branch of agricultural science has been primarily exploited for commercial

purposes, but recently its potential for public goods-related research has begun to be realized. Most CGIAR Centers are using biotechnologies and integrating them into their ongoing research programs. The major foci of the Centers' biotechnology work are crop improvement and propagation, disease detection, and germplasm storage and exchange. System-wide investment in biotechnology is currently about US\$30 million.

The CGIAR has taken important steps to assure consistency and uniformity in its policies regarding biotechnology. In 1997, it sought the advice and recommendations of two expert panels established under the auspices of the Technical Advisory Committee. One panel addressed a broad set of biotechnology issues and the other focused on intellectual property rights.

In 1998, the Centers issued a position statement on biotechnology

that outlined nine key propositions. In addition, they decided to create a central service unit to provide professional advice on the proprietary, biosafety, and gene deployment considerations of CGIAR research projects. At ICW98, the CGIAR declared that the Centers, which are engaged in breeding new crop varieties for resource-poor farmers, will not incorporate into their breeding material any genetic systems designed to prevent seed germination.

To further its mission, the CGIAR will form strategic alliances and partnerships with both public- and private-sector institutions and organizations engaged in biotechnology and will develop needs-based, in-house biotechnology capability that will address the present and future needs of small-scale farmers and contribute to national agricultural research systems.



Genetic engineering techniques are helping scientists at CIMMYT add an extra coat to the armor of tropical maize against insect pests.

knowledge-intensive. The review panel concluded that the CGIAR has emerged as the only effective and credible international agricultural research system. Moreover, the panel noted that as a “knowledge bridge” between science and farming the CGIAR has become a model for international scientific collaboration to address the needs of the poor. It remains the only organization that provides agricultural knowledge as an international public good—that is, provides scientific information and expertise that is highly applicable in developing countries and that will not be produced at optimal levels by individual countries or the private sector.

### Positioning the CGIAR for Leadership in the 21st Century.

In summary, the review panel concluded that “the unique leadership of the CGIAR is key to ensuring that today’s scientific revolutions in biology and information technology—which will dramatically transform global agriculture in the 21st century—benefit those most at risk in the 21st century.” Those most at risk are the 840 million people—mostly women and children—who are hungry today and more than 2 billion additional people who will be born by the year 2025.

The third System Review provides a compass for the CGIAR’s future research and strategic direction. Clearly, the CGIAR must build on its historic strengths and numerous comparative advantages—its clearly defined mission, dedicated professionals, unique constituency, significant germplasm collections, abilities to improve crop varieties, research focus on natural resources, extensive training and education capabilities, and policy expertise.

At ICW98, CGIAR members adopted three of the review panel recommendations. Most importantly, they endorsed a new mission statement for the 21st century:

*To contribute to food security and poverty eradication in developing countries through research, partnerships, capacity building, and policy support, promoting sustainable agricultural devel-*

*opment based on the environmentally sound management of natural resources.*

The Centers were encouraged to adopt complementary mission statements that emphasize their role as global centers of frontier science. CGIAR members also endorsed the goals and principles embodied in the panel’s recommendations on broadening CGIAR partnerships through implementation of more effective consultative processes.

The newly formed Consultative Council, which broadly reflects the CGIAR membership, began preparing proposals to implement other panel recommendations, which CGIAR members will consider at the 1999 mid-term meeting in Beijing.

Adequate preparation for the 21st century will place numerous demands on the CGIAR: establishment of long-term strategies; proactive protection of access to its germplasm resources; reduction of financial constraints on the Centers; mobilization of funds from private sources; enhancement of inter-Center research; and demonstration of that research’s field-level impacts, especially in Africa. The success of the CGIAR in meeting these demands will be measured against its nearly 30-year record of scientific knowledge-building and field-level accomplishment—a record that is now far better understood thanks to the diligent work of Maurice Strong and his review panel colleagues.



### CGIAR Centers Help Rebuild Small Farmers' Seed Systems

Hurricane Mitch was the most devastating natural disaster to hit Central America in the 20th century. The numbers of dead and missing in Honduras and Nicaragua reached into the thousands. Roads, bridges, and other infrastructure were left in ruins. Roughly 80 percent of the export-oriented agriculture in the two countries was destroyed. And more than half of the basic food crops—beans, maize, and rice—were lost.

Only a few days before Mitch's torrential forces hit the ground, the final touches were put to a digital atlas of Honduras that contains more than 90 layers of information—details about soil type, climate, population, roads and bridges, marketplaces, and water pumps. Initially, the map, compiled by CIAT with Swiss government support, was intended to aid in agricultural and environmental

planning. Instead, it has become a central tool in overall disaster relief aid and recovery efforts.

More than 60 percent of the Honduran workforce is employed in farming, and 75 percent of the Honduran population's total caloric intake comes from maize and beans. Thus, restoring small farm production and regaining rural earning power became the top priorities. But to become really useful, the "before-Mitch" atlas profile of the Honduran countryside needed to be supplemented with some additional data about flooding that was available from Radarsat, a sophisticated Canadian satellite capable of detecting detailed water and land features even through rain and thick clouds.

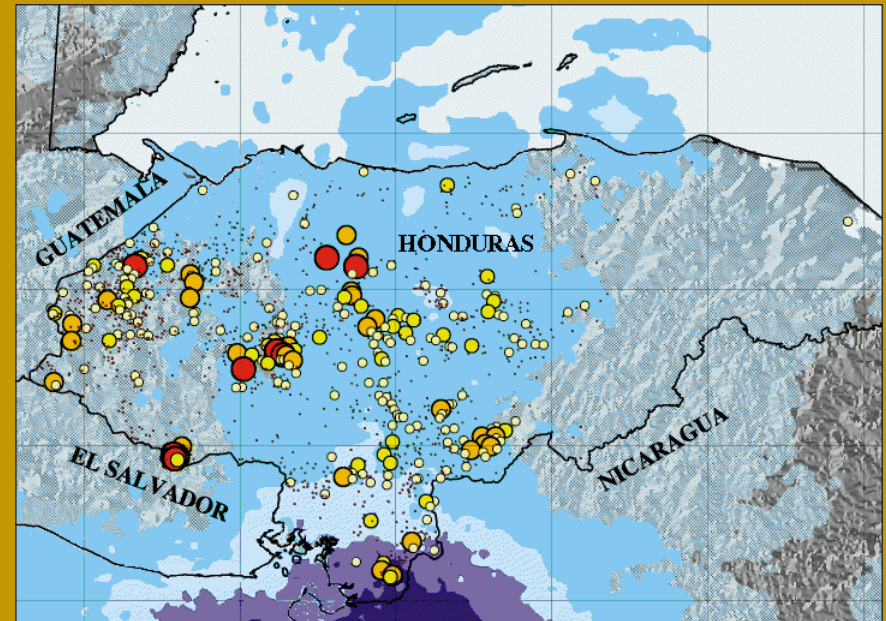
Initially, the Radarsat data was combined with "after-Mitch" data on Honduras's rural infrastructure to create a "real-time Mitch atlas." This atlas helped the Honduran

government and aid agencies to direct relief efforts to the neediest areas. It also made seed production and distribution, the key activities for agriculture's recovery in 1999, easier to plan.

Under the auspices of the CGIAR's Ecoregional Program for Tropical Latin America, four Centers—CIAT, CIMMYT, CIP, and IPGRI—have mounted an emergency effort to rebuild small farmers' seed systems and to regenerate agriculture in both Honduras and Nicaragua. This effort will draw on lessons from the successful Seeds of Hope program carried out in Rwanda after genocide and civil war shattered that country's crop production.

Given that many rural communities have been isolated by Mitch, seed distribution must be highly decentralized. Therefore, the CGIAR Centers will work with a wide range of national

institutions, local and international NGOs, and farmer groups. CIAT's digital atlas of Honduras, which contains extensive information about features of the rural landscape, is supplying a powerful tool for national, NGO, and community planners.



Maps using sophisticated GIS techniques allow policymakers to focus rehabilitation efforts where needs are greatest. (Circles show villages where beans are grown.)

### CGIAR King Baudouin Awards

In 1980, the CGIAR received the King Baudouin International Development Prize for its “contribution to the qualitative and quantitative improvement of food production in the world.” Using funds received from the prize, the CGIAR established its own biennial King Baudouin Award to stimulate agricultural research and to recognize achievements stemming from the work of its Centers.

## 1998

**ICRISAT** received the award for its research to improve pigeonpea, a grain legume that contributes protein to the diets of an estimated 1.1 billion people worldwide.

## 1996

**ICRISAT** won the award for its development of new, disease-resistant varieties of pearl millet, a staple food for tens of millions of poor people in Africa and in India.

## 1994

**IITA** received the award for successfully developing hybrid plantains that are highly resistant to black sigatoka, a devastating fungus, and that produce double the yields of existing varieties.

## 1992

**CIP** received the award for development of a series of integrated pest management practices and creation of a hybrid “hairy potato” with resistance to a range of insect pests.

## 1990

**IITA and CIAT** won the award for their successful biological control campaign against the cassava mealybug in sub-Saharan Africa.

## 1988

**CIMMYT** won the award for its wheat breeding strategies that led to development of Veery wheats, which have increased both yield potential and yield stability.

## 1986

**IITA** received the award for its research in breeding resistance to maize streak virus, an endemic disease affecting maize throughout Africa.

## 1984

**CIAT** received the award for its pioneering work to develop new bean varieties with resistance to golden mosaic virus.

## 1982

**IRRI** won the CGIAR's first King Baudouin Award for development of IR36, an early maturing, high-yielding rice variety with broad resistance to biological stresses and tolerance for numerous physiological stresses.

## 1998

**Keith Ballingall (ILRI)**

received the Promising Young Scientist Award for research on how the genetic make-up of cattle influences the cattle's immunizations with ILRI's novel vaccines.

**Kedar N. Rai (ICRISAT)**

received the Outstanding Local Scientist Award for contributions to the pearl millet research program.

**Imad Eujayl (ICARDA)**

received the Outstanding Local Scientific Support Staff Award for contributions to ICARDA's biotechnology program.

**ICLARM, Bureau of Fisheries and Aquatic Resources (Philippines), Freshwater Aquaculture Center, Central Luzon State University (Philippines), and Institute of Aquaculture Research (Norway)** received the Outstanding Scientific Partnership Award for producing a highly improved strain of tilapia.

### Chairman's Excellence in Science Awards

Presented each year, four special awards—the Promising Young Scientist, the Outstanding Local Scientist, the Outstanding Local Scientific Support Staff, and the Outstanding Scientific Partnership—recognize outstanding scientific achievements by CGIAR scientists and support staff.

## 1997

**Marianne Bänziger**

**(CIMMYT)** received the Promising Young Scientist Award for research on maize.

**A.K. Singh (ICRISAT)**

received the Outstanding Local Scientist Award for research on the genome constitution, interspecific gene transfer, and conservation of groundnut genetic resources.

**Marco Rondón (CIAT)**

received the Outstanding Local Scientific Support Staff Award for outstanding and innovative contributions to research programs at CIAT.

**Kenya Agricultural Research Institute and ILRI**

received the Outstanding Scientific Partnership Award for collaborative research to enhance small-holder dairying in Kenya.

## 1996

**Shaobing Peng (IRRI)**

received the Promising Young Scientist Award for research on the physiological processes underlying yield potential in rice at IRRI.

**Thelma Paris (IRRI)**

received the Outstanding Local Scientist Award for research linking human nutrition and agriculture and for studies on gender issues in rice-based farming at IRRI.

**Shashi Sharma (ICRISAT)**

received the Outstanding Local Scientist Award for outstanding achievement in research on nematode parasites of pigeonpea, chickpea, and groundnut at ICRISAT.

**IITA and Institute of Agricultural Research, (Njala, Sierra Leone)**

received the Outstanding Scientific Partnership Award for collaborative research on the improvement of root and tuber crops in West Africa.





**T**he global agricultural research system thrives on a balance of synergies and diversity. One key component of this system, the CGIAR, is a knowledge catalyst. It nurtures the creativity of scientists and builds knowledge partnerships for the common good. 🌾

## Financial Highlights

CGIAR members support Centers and programs of their choice, and each Center directly receives and spends funds. The financial highlights discussed here reflect a consolidation of the financial results of the sixteen independent CGIAR Centers. The results are reported in U.S. dollars. CGIAR financial highlights for 1993 to 1998 are shown in the tables. Further details are provided in the *CGIAR 1998 Financial Report*, a separate publication available from the CGIAR Secretariat.

**Contribution Profile.** In 1998, 54 members—four more members (Kenya, New Zealand, Peru, and Nigeria) than in 1997—made contributions totaling \$340 million in support of the CGIAR research agenda. For analytical purposes, these members can be placed into four groups: industrial countries (21), developing countries (18), foundations (3), and international and regional organizations (12). Industrial countries can be further subdivided along geographical lines into three subgroups: Europe, North America, and the Pacific Rim. Trends associated with any of the groups should not be interpreted as policy decisions by the groups because contributions to the CGIAR are voluntary, and each member decides the amount and recipients of its contributions.

As shown in Figure 1, the amount of contributions to the agenda from all member groups and

from non-members rose in 1998. The \$20 million increase from 1997 reflects the special efforts of individual members—the European Commission, Switzerland, the United States, Germany, Sweden, and Norway—and of the international organizations ADB and IFAD. Kenya, Peru, and New Zealand made first-time contributions, and several other developing country members stepped up their support in 1998. One of these members, Colombia, increased its support by \$0.8 million. As a result, contributions from developing countries rose more than 17 percent from 1997. These countries' share of total agenda support in 1998 was 4 percent, 22 percent higher than in 1997.

Contributions from the top 10 contributors to the CGIAR in 1998 funded about three-quarters of the research agenda, the same proportion as in 1997. These contributions are illustrated in Figure 2. The USA maintained its position as the largest contributor after the World Bank; Colombia maintained its position as the largest contributor among the developing countries.

**Disbursement Schedule.** Targets set under the stabilization program for the disbursement of funds—50 percent in January and the balance by mid-year—were not met in 1998. Only 34 percent of funds were

Figure 1. Contributions to CGIAR

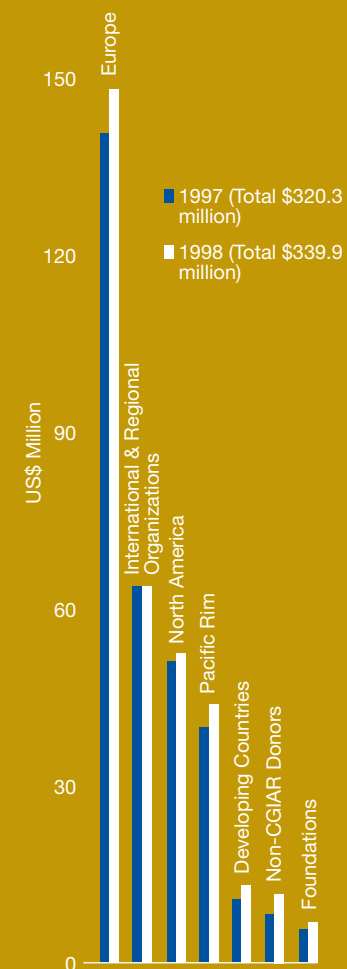




Figure 2. Top Ten Contributors to CGIAR

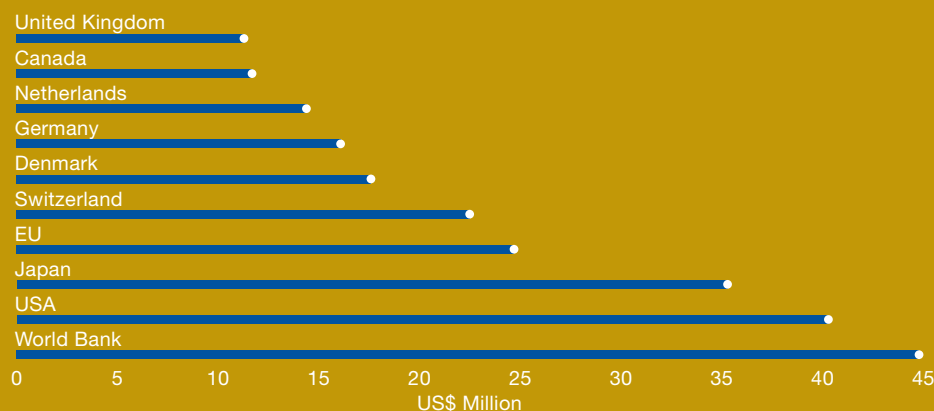
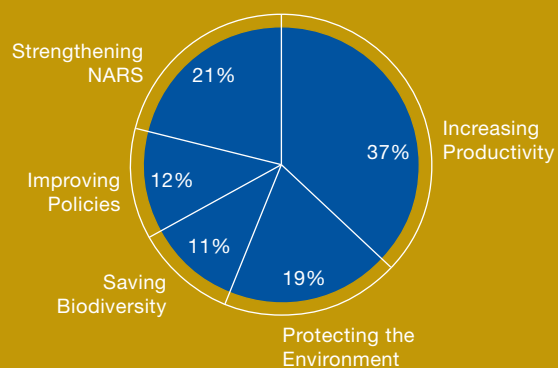


Figure 3. CGIAR Investments by Principal Activity



disbursed in the first half of the 1998 fiscal year, compared with 39 percent in the first half of the 1997 and 1996 fiscal years. At the end of the third quarter, 41 percent were disbursed, compared with 48 percent in 1997 and 65 percent in 1996. By the end of 1998, 88 percent of funds had been disbursed, compared with 89 percent in 1997 and 93 percent in 1996. Contributions outstanding at the end of 1998 amounted to 12 percent. However, dollar receipts increased in absolute terms: \$300 million in 1998, compared with \$285 million in 1997.

**Allocation of Resources.** The allocation of resources in support of the research agenda is reviewed below by undertaking, Center, object of expenditure, and region.

**Investments in Undertakings.** Investments in the five principal CGIAR undertakings—increasing productivity, protecting the environment, saving biodiversity, improving policies, and strengthening NARS—are shown in Figure 3. The overall distribution of resources in 1998 did not significantly change from that in 1997. Increasing productivity continued to be the primary thrust of CGIAR activities. In terms of production sectors, crops remained the primary focus. This sector accounted for 70 percent of investments, followed by livestock at 18 percent, forestry at 9 percent, and fish at 3 percent of investments.

**Distribution among Centers.** Figure 4 shows the distribution of investments in CGIAR Centers in 1998.

**Expenditure by Object.** The trend in reduced personnel spending noted in the recent past continued in 1998. Personnel costs amounted to 50 percent of the total in 1998, compared with 51 percent in 1997, and an average of 55 percent from 1994 to 1996. Total staff numbers remained at around 8,500, of which 1,000 were internationally recruited.

**Allocation by Region.** The 1998 resource allocation by region is shown in Figure 5. At 40 percent of total investment, investment in sub-Saharan Africa (SSA) remained the same. Investment in Asia increased from 31 percent to 32 percent, largely through increased investment in IRRI. Allocations to Latin America and the Caribbean increased from 17 percent to 18 percent. Investment in West Asia and North Africa (WANA) decreased from 12 percent to 10 percent of total investment. Almost all Centers made investments in SSA in 1998; four Centers—IITA, ILRI, ICRAF, and ICRISAT—accounted for more than two-thirds of allocations to this region. The pattern was similar in Asia. A majority of the Centers made investments in Asia; four Centers—IRRI, ICRISAT, CIMMYT, and CIP—accounted for the majority of allocations to this region. More than two-thirds of the allocations for WANA continued to be made by ICARDA. CIAT accounted for about half of the allocations made in Latin America and the Caribbean.

Figure 4. Funding by Center

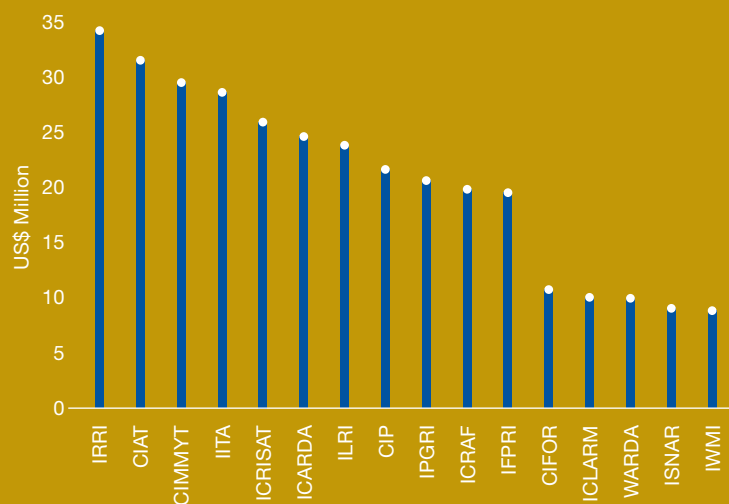
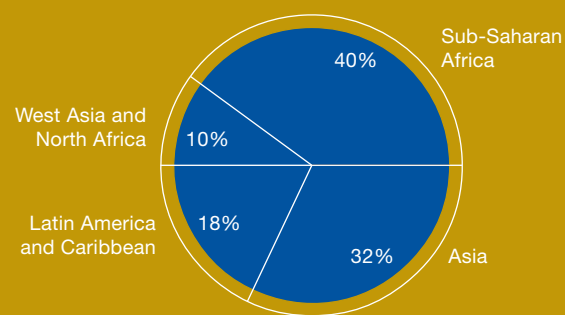


Figure 5. CGIAR Allocations by Developing Region



## CGIAR Research Agenda Financial Highlights, 1993–1998 (in US\$ million and percent)

	1993	1994	1995	1996	1997	1998
<b>Member Contributions (in \$ m)</b>	235	268	270	304	320	340
Annual change (%)	5%	14%	1%	13%	5%	6%
<b>Composition of Membership Support (in \$ m)</b>						
DAC Countries						
Europe	81	100	107	132	141	148
Pacific Rim	37	41	39	43	40	44
North America	56	48	45	45	51	52
Developing Countries	2	3	5	8	11	13
Foundations	3	4	4	6	6	7
International and Regional Organizations	56	71	68	65	64	64
Non-CGIAR donors			1	5	7	12
<b>Number of Contributing CGIAR Members</b>	38	40	41	44	50	54
CGIAR Contributions as % ODA	0.42%	0.45%	0.46%	0.55%	0.67%	0.71%
<b>Composition of CGIAR Investments by Undertakings (%)</b>						
Increasing Productivity	48%	46%	47%	40%	40%	37%
Protecting the Environment	14%	15%	16%	16%	17%	19%
Saving Biodiversity	6%	9%	10%	11%	11%	11%
Improving Policies	10%	10%	9%	12%	11%	12%
Strengthening NARS	22%	20%	18%	21%	21%	21%
<b>Center Operating Expenditure (in \$ m)</b>	254	265	286	325	333	337
<b>Distribution by Object of Expenditure (%)</b>						
Personnel	59%	56%	55%	53%	51%	50%
Supplies/Services	28%	31%	31%	34%	36%	37%
Travel	6%	6%	7%	7%	7%	7%
Depreciation	7%	7%	7%	6%	6%	6%
<b>Allocation by Region (%)</b>						
Sub-Saharan Africa	37%	39%	39%	38%	40%	40%
Asia	34%	32%	32%	33%	31%	32%
Latin America and the Caribbean (LAC)	15%	18%	17%	17%	17%	18%
West Asia and North Africa (WANA)	13%	11%	12%	12%	12%	10%

CGIAR Contributions to the Research Agenda by Center, 1972–1998<sup>1</sup> (in US\$ million)

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
CIAT	4.3	6.1	5.5	6.0	6.3	9.5	11.7	13.4	15.0	16.2	18.6	21.7	23.5
CIFOR													
CIMMYT	5.0	6.3	6.1	7.6	8.7	10.1	12.7	14.9	16.6	18.4	18.3	17.5	20.7
CIP	0.5	1.3	2.2	2.7	4.1	5.6	5.4	7.1	7.7	9.0	9.6	10.1	9.7
ICARDA					1.5	4.6	7.5	10.1	11.8	13.1	15.0	19.7	21.0
ICLARM													
ICRAF													
ICRISAT	0.3	2.7	3.8	6.1	6.8	9.8	12.6	11.8	12.3	13.0	15.9	21.0	21.0
IFPRI				0.3	0.8	1.2	1.6	1.9	2.5	2.8	3.1	3.8	4.3
IITA	6.4	6.1	6.7	8.5	9.4	10.7	14.9	15.7	15.5	15.5	18.8	19.9	20.9
ILRI <sup>2</sup>			1.0	3.7	8.9	11.9	15.2	16.2	18.9	18.5	16.9	19.8	21.9
IPGRI <sup>3</sup>				0.5	0.9	1.3	1.7	2.4	3.0	3.0	3.6	3.6	4.0
IRRI	3.0	3.1	6.0	8.5	9.7	12.0	12.4	13.8	15.9	17.2	19.5	20.2	19.7
ISNAR									1.1	2.2	2.3	3.0	3.3
IWMI													
WARDA			0.5	0.6	0.8	1.3	1.9	1.8	2.5	2.0	2.2	2.8	2.0
<b>Subtotal</b>	<b>19.5</b>	<b>25.7</b>	<b>31.7</b>	<b>44.4</b>	<b>58.0</b>	<b>77.9</b>	<b>97.6</b>	<b>109.1</b>	<b>122.8</b>	<b>130.9</b>	<b>143.9</b>	<b>163.0</b>	<b>172.0</b>
Reserves/ CGIAR Committees												1.7	1.0
<b>Total</b>	<b>19.5</b>	<b>25.7</b>	<b>31.7</b>	<b>44.4</b>	<b>58.0</b>	<b>77.9</b>	<b>97.6</b>	<b>109.1</b>	<b>122.8</b>	<b>130.9</b>	<b>143.9</b>	<b>164.7</b>	<b>173.0</b>

<sup>1</sup>Figures shown for 1972–1980 are total expenditures (operations/capital) and may be higher or lower than the contributions for that year (because of the accounting convention followed in the 1970s).

<sup>2</sup>Formerly ILCA and ILRAD.

<sup>3</sup>Formerly IBPGR and INIBAP.



1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
21.2	22.0	24.1	24.4	28.4	27.7	27.9	26.9	25.3	28.9	26.8	31.0	31.7	32.1	536.1
							3.2	5.1	5.8	7.7	8.7	10.6	11.3	52.3
19.4	21.3	23.3	25.9	27.9	27.1	26.6	26.1	23.1	27.2	26.4	27.4	28.6	30.1	523.2
10.2	13.3	12.8	17.8	18.6	16.9	17.1	15.3	14.7	18.8	19.9	22.7	22.6	22.2	318.0
17.8	18.0	18.3	17.3	18.4	18.7	19.5	17.9	16.2	18.3	18.7	21.1	22.3	25.2	372.0
							4.5	3.8	4.8	7.6	9.6	9.0	10.6	49.9
							11.1	11.2	15.5	16.2	17.4	21.8	20.4	113.5
20.3	25.0	26.2	26.0	30.1	31.5	29.4	27.3	26.0	27.6	26.0	27.4	26.9	26.5	513.3
4.4	4.9	6.0	8.7	8.8	9.1	8.9	8.3	8.1	9.3	9.7	16.0	18.2	20.1	162.5
20.4	21.1	19.9	21.1	22.0	22.5	22.4	21.7	20.8	24.1	22.2	22.4	27.5	29.2	486.5
22.5	25.8	25.7	29.1	33.7	33.8	32.9	28.4	22.2	25.0	24.3	24.8	25.2	24.4	530.7
4.2	5.1	5.5	5.9	7.1	7.0	8.1	10.8	10.4	14.0	12.6	16.4	18.8	21.2	171.1
21.0	24.2	24.9	26.5	26.6	29.8	29.8	28.6	26.3	28.2	27.2	28.7	28.6	34.8	546.1
3.7	4.5	5.5	6.8	7.5	7.0	7.6	7.0	6.1	6.4	6.4	10.7	9.9	9.6	110.6
							6.4	6.1	7.3	7.2	9.0	9.5	9.4	54.9
2.5	3.1	4.2	5.4	6.1	6.2	6.7	5.6	5.4	6.7	8.1	8.7	8.6	10.5	106.1
167.6	188.4	196.3	214.9	235.2	237.4	236.7	249.2	230.6	268.1	267.1	301.9	319.6	337.4	4632.5
2.6	3.8	5.3	-3.4	-10.7	-2.5	-4.7	-1.9	4.1		2.5	2.3	0.8	2.5	3.3
170.2	192.2	201.6	211.5	224.5	234.9	232.0	247.3	234.7	268.1	269.6	304.1	320.4	339.9	4635.8

## CGIAR Contributions to the Research Agenda 1972–1998 (in US\$ million)

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
<b>Industrialized Countries</b>													
Australia		0.0	1.0	1.2	1.7	1.8	2.6	2.7	3.0	3.3	3.8	4.1	4.0
Austria													
Belgium	0.1	0.6	0.4	0.6	1.7	2.3	2.7	3.1	3.3	2.4	1.9	1.9	1.7
Canada	1.2	1.8	4.7	4.3	5.4	6.8	7.4	7.5	6.9	7.5	8.3	9.9	10.0
Denmark	0.3	0.2	0.4	0.4	0.5	0.6	0.8	1.0	1.2	1.1	1.0	1.0	1.2
EU						2.5	2.2	3.8	4.5	4.3	4.7	5.2	4.7
Finland													0.5
France			0.1	0.4	0.5	0.4	0.3	0.7	0.9	0.8	0.9	1.0	0.9
Germany		1.8	3.0	3.9	4.5	5.4	6.8	8.5	10.1	8.4	7.8	7.9	6.7
Ireland									0.2	0.2	0.2	0.3	0.4
Italy					0.1	0.0	0.1	0.1	0.7	1.0	1.6	6.1	6.6
Japan	0.1	0.2	0.3	0.7	1.2	2.5	3.5	4.8	7.0	8.1	8.9	9.1	9.7
Luxembourg													
Netherlands	0.4	0.4	0.6	1.2	1.5	1.7	1.8	2.4	2.6	3.0	3.2	3.6	3.3
New Zealand					0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Norway	0.8	0.2	0.4	0.8	1.1	1.5	1.9	2.0	2.0	1.9	1.9	2.2	1.9
Portugal													
Saudi Arabia					1.0	1.0						1.5	1.5
Spain										0.5	0.5	0.5	0.5
Sweden	1.0	0.2	1.5	2.3	2.3	2.2	2.7	3.1	3.4	3.3	3.2	3.1	3.1
Switzerland		0.4	0.1	0.5	0.9	1.2	1.4	1.9	2.5	2.6	2.8	4.9	6.7
United Kingdom	0.7	1.1	1.9	2.4	2.9	3.5	4.8	6.4	6.8	6.0	6.3	5.9	5.7
USA	3.8	5.4	6.8	10.8	14.9	18.1	21.1	24.8	29.0	35.0	40.8	44.6	45.3
<b>Subtotal</b>	<b>8.2</b>	<b>12.3</b>	<b>21.2</b>	<b>29.6</b>	<b>40.2</b>	<b>51.6</b>	<b>60.0</b>	<b>72.8</b>	<b>84.0</b>	<b>89.4</b>	<b>97.6</b>	<b>112.7</b>	<b>114.4</b>
<b>Developing Countries</b>													
Bangladesh													
Brazil													1.0
China													0.5
Colombia													
Côte d'Ivoire													
Egypt													
India										0.5	0.5	0.5	0.5
Indonesia													
Iran					2.0	2.0	1.0						
Kenya													

1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
4.2	4.5	2.9	3.1	3.7	3.8	3.2	4.4	4.2	4.8	5.6	6.5	6.6	7.8	94.4
	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.5	1.5	1.5	1.5	1.8	2.3	17.1
2.0	1.8	2.7	2.5	2.5	3.2	3.3	3.3	2.5	3.6	4.9	5.6	5.7	6.0	72.1
9.7	10.7	11.8	13.8	14.4	15.4	15.7	17.6	15.8	15.3	12.7	13.9	12.9	11.9	273.1
1.1	1.7	2.3	2.5	2.6	3.6	3.4	4.9	4.8	7.3	10.0	18.0	19.1	17.8	108.6
6.6	7.1	9.1	9.2	11.8	15.4	13.5	13.3	12.1	14.7	16.7	19.7	23.1	24.9	229.2
0.6	1.0	2.3	2.7	5.2	5.3	5.9	1.0	0.2	0.5	1.0	1.1	2.1	2.1	31.6
1.2	2.1	3.2	3.3	3.6	4.1	4.1	4.9	3.2	3.9	4.7	4.7	4.9	6.2	61.1
6.2	8.0	10.4	10.8	11.2	11.2	11.0	13.7	13.3	16.6	15.8	16.8	16.9	16.3	252.7
0.4	0.6	0.7	0.2	0.3	0.3	0.3	0.3	0.7	0.6	0.7	0.7	0.8	1.0	8.9
6.5	8.3	10.1	8.1	9.5	6.1	6.1	5.8	3.9	2.8	2.7	2.3	4.0	3.0	95.5
11.1	15.9	18.0	20.2	19.9	23.2	23.7	26.9	32.6	36.4	33.9	36.4	33.6	35.5	423.3
						0.3		0.1	0.2	0.3	0.4	0.7	0.7	2.7
3.8	6.7	5.6	6.3	5.5	6.9	6.5	7.6	8.3	11.5	12.8	15.6	14.5	14.6	151.9
0.0	0.0												0.4	0.7
2.3	3.1	3.2	3.9	4.1	4.7	4.7	5.8	4.7	5.4	6.1	6.3	7.2	8.4	88.6
												0.3	0.3	0.5
														5.0
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.7	0.8	1.2	1.8	1.1	12.3
3.0	4.2	4.9	5.4	5.5	6.2	6.1	8.6	6.2	8.4	7.3	8.4	7.1	9.3	121.9
5.2	7.1	7.7	9.6	9.5	9.4	10.2	10.6	9.2	12.9	11.9	19.0	20.9	22.7	191.5
6.3	8.4	10.3	11.5	10.9	11.6	11.6	11.1	9.4	9.8	9.9	10.7	10.2	11.5	197.5
45.2	46.3	40.2	42.2	44.1	45.1	45.6	48.1	40.5	32.3	32.1	30.5	38.3	40.5	871.3
115.8	138.9	146.9	156.8	165.7	176.8	176.5	189.7	173.8	189.5	191.5	219.6	232.0	244.3	3311.6
												0.1	0.1	0.2
			0.0	0.1	0.0	0.1					0.0	0.5	0.7	2.4
0.5	0.5	0.3	0.3	0.3	0.3	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	6.5
									1.2	1.1	2.1	2.6	2.5	9.5
											0.3	0.2	0.1	0.6
										0.5	0.5	1.1	1.4	3.5
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1.3	1.3	0.8	0.8	11.1
								0.5	0.1	0.1	0.5	0.5	0.1	1.9
										0.5	1.4	1.5	2.0	10.4
													0.5	0.5

(continued)

## CGIAR Contributions to the Research Agenda, 1972–1998 (in US\$ million) Continued

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
<b>Developing Countries (cont.)</b>													
Korea													
Mexico									0.5	1.0	0.1	0.2	1.2
Nigeria				0.6	0.6	0.6	0.8	0.8	2.0	1.1	1.1	1.0	1.0
Pakistan													
Peru													
Philippines									0.2	0.5	0.5	0.4	0.3
Romania													
Russian Federation													
South Africa													
Thailand													
<b>Subtotal</b>				<b>0.6</b>	<b>2.6</b>	<b>2.6</b>	<b>1.8</b>	<b>0.8</b>	<b>2.6</b>	<b>3.1</b>	<b>2.2</b>	<b>2.0</b>	<b>4.5</b>
<b>Foundations</b>													
Ford Foundation	5.3	3.7	3.0	2.8	2.0	1.6	1.0	1.0	1.3	1.3	0.8	1.3	1.0
Kellogg Foundation	0.2	0.3	0.3	0.3	0.3	0.3	0.3					0.6	0.3
Kresge Foundation <sup>1</sup>	0.8												
Leverhulme Trust <sup>1</sup>									0.5	0.6	0.7	0.8	0.8
Rockefeller Foundation	4.0	4.5	3.5	2.9	2.2	1.6	1.3	1.2	1.6	1.0	0.8	0.5	0.5
<b>Subtotal</b>	<b>10.2</b>	<b>8.5</b>	<b>6.8</b>	<b>6.0</b>	<b>4.5</b>	<b>3.5</b>	<b>2.6</b>	<b>2.2</b>	<b>3.4</b>	<b>2.9</b>	<b>2.3</b>	<b>3.2</b>	<b>2.6</b>
<b>International &amp; Regional Organizations</b>													
ADB				0.3		0.5		0.7					
AFDB							0.0	0.0	0.0	0.0			
Arab Fund						0.3	0.3		0.3	0.2	0.2	0.2	0.2
FAO													
IDB			2.0	4.1	5.0	5.7	6.2	6.2	6.7	7.4	8.1	8.2	8.7
IDRC	0.2	0.3	0.6	1.0	1.8	1.3	1.0	0.8	1.5	1.0	1.2	1.8	1.0
IFAD								1.6	3.6	5.9	5.9	8.4	7.0
OPEC Fund									0.9	1.1	3.6	2.3	2.2
UNDP	0.9	1.0	1.5	2.2	1.9	3.5	4.4	4.0	4.6	5.2	6.2	6.9	8.1
UNEP				0.6	0.3	0.3		0.2			0.2	0.1	0.0
World Bank	1.3	2.8	2.4	3.2	6.5	7.9	8.7	10.2	12.0	14.6	16.3	19.0	24.3
<b>Subtotal</b>	<b>2.3</b>	<b>4.1</b>	<b>6.5</b>	<b>11.4</b>	<b>15.6</b>	<b>19.5</b>	<b>20.6</b>	<b>23.6</b>	<b>29.6</b>	<b>35.5</b>	<b>41.8</b>	<b>46.8</b>	<b>51.6</b>
<b>Others<sup>1</sup></b>													
<b>Total</b>	<b>20.7</b>	<b>25.0</b>	<b>34.5</b>	<b>47.5</b>	<b>62.9</b>	<b>77.2</b>	<b>85.0</b>	<b>99.5</b>	<b>119.6</b>	<b>130.9</b>	<b>143.8</b>	<b>164.7</b>	<b>173.2</b>

<sup>1</sup>Past CGIAR member



1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
						0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.9	4.6
0.4	0.2	0.1				0.1	0.0	0.0		0.3	0.2	0.5	0.6	5.3
0.9	0.2	0.2	0.1	0.0	0.1	0.1	0.0	0.0				0.1	1.0	12.4
												0.5	0.2	0.7
													0.4	0.4
0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.7	0.4	0.7	6.9
									0.2					0.2
												2.5	0.6	1.1
												0.5	0.3	0.8
2.4	1.6	1.3	1.2	1.0	1.1	1.8	1.8	2.3	3.3	5.0	8.2	10.8	13.2	78.1
0.9	0.9	0.9	0.8	0.8	0.9	1.2	1.8	2.3	3.1	2.5	3.3	3.2	3.1	51.8
											0.4	0.3	0.3	3.9
														0.8
0.6	0.6										0.1			4.6
0.8	0.9	0.9	0.9	1.9	1.7	0.9	1.5	0.9	1.3	1.7	2.4	2.2	3.4	46.8
2.3	2.5	1.8	1.7	2.7	2.7	2.1	3.2	3.1	4.6	4.2	6.1	5.9	6.8	102.5
				0.0	0.6	0.3	0.8	0.2	0.6	1.0	1.4	1.8	3.8	12.1
0.0	0.6	0.7	0.7	1.1	1.2	1.6	0.2	1.1	1.5	1.1	1.7	1.0	0.8	13.5
0.3	0.3	0.4	0.4	0.5		0.6	0.6	0.7	1.3	1.2	1.3	1.0	1.5	12.1
												0.3	0.6	0.8
8.2	9.4	10.3	10.5	11.1	10.5	6.3	5.1	5.1	6.2	3.8	5.7	4.6	2.1	167.1
1.3	1.2	0.8	0.6	0.6	0.8	0.5	0.9	0.5	1.1	0.8	1.2	2.6	2.6	28.9
3.2	0.5	0.3	0.3	0.5	0.5	0.4	0.4	0.6	0.4	1.0	1.9	3.1	4.0	49.2
1.0	0.5	0.5	0.3	0.3		0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	13.8
7.5	8.4	8.7	9.0	7.5	6.3	6.6	6.9	7.3	9.5	8.4	6.5	4.5	3.2	150.5
			0.1	0.0		0.0		0.0	0.2	0.7	0.3	0.2	0.1	3.3
28.1	28.4	30.0	30.0	33.3	34.3	35.1	37.6	40.0	50.0	50.0	44.9	45.0	45.0	660.8
49.6	49.2	51.6	51.8	55.1	54.3	51.6	52.6	55.6	70.9	68.2	65.0	64.3	63.9	1112.2
										0.7	5.2	7.0	11.7	26.2
170.1	192.2	201.6	211.5	224.5	234.9	232.0	247.3	234.7	268.1	269.6	304.1	319.6	339.9	4635.8

## CGIAR Research Centers


**International Center  
for Tropical Agriculture  
(CIAT)**

[www.cgiar.org/ciat](http://www.cgiar.org/ciat)

**Headquarters:**

Cali, Colombia

**Director General:**

Grant Scobie

**Board Chair:**

Robert Havener (until  
December 7, 1998)

Fernando Chaparro (from  
December 8, 1998)

**Founded:** 1967

**Joined the CGIAR:** 1971

**Regional Offices:** Cruz  
das Almas, Brazil; Quito,  
Ecuador; Guatemala City,  
Guatemala; Tegucigalpa,  
Honduras; Lilongwe,  
Malawi; Managua,  
Nicaragua; Manila, Philip-  
pines; Arusha, Tanzania;  
Bangkok, Thailand;  
Kampala, Uganda.

**Focus:** To alleviate  
hunger and poverty in  
tropical countries by  
applying science to the  
generation of technology  
that will lead to lasting  
increases in agricultural  
output while preserving

the natural resource  
base. Research focuses  
on the development of  
germplasm for beans,  
cassava, tropical forages,  
and rice for Latin America  
and on improving  
resource management in  
humid agroecosystem  
areas in tropical America,  
such as hillsides, forest  
margins, and savannas.


**Center for International  
Forestry Research  
(CIFOR)**

[www.cgiar.org/cifor](http://www.cgiar.org/cifor)

**Headquarters:**

Jakarta, Indonesia

**Director General:**

Jeffrey Sayer

**Board Chair:**

Gill Shepherd

**Founded:** 1992

**Joined the CGIAR:** 1992

**Focus:** To contribute to  
the sustained well-being  
of people in developing  
countries, particularly in  
the tropics, through col-  
laborative strategic and  
applied research in forest

systems and forestry, and  
by promoting the transfer  
of appropriate new tech-  
nologies and the adop-  
tion of new methods of  
social organization for  
national development.


**CIMMYT  
International Center  
for the Improvement  
of Maize and Wheat  
(CIMMYT)**

[www.cgiar.org/cimmyt](http://www.cgiar.org/cimmyt)

**Headquarters:**

Mexico City, Mexico

**Director General:**

Timothy Reeves

**Board Chair:** Wally Falcon

**Founded:** 1966

**Joined the CGIAR:** 1971

**Regional Offices:** Dhaka,  
Bangladesh; Santa Cruz,  
Bolivia; Beijing, China;  
Cali, Colombia; San José,  
Costa Rica; Addis Ababa,  
Ethiopia; Guatemala City,  
Guatemala; Tegucigalpa,  
Honduras; Almaty, Kazak-  
stan; Nairobi, Kenya;  
Kathmandu, Nepal;  
Makati City, Philippines;  
Aleppo, Syrian Arab

Republic; Bangkok,  
Thailand; Ankara, Turkey;  
Montevideo, Uruguay;  
Harare, Zimbabwe.

**Focus:** To help the poor  
through agricultural  
research and in concert  
with national research  
systems, by increasing the  
productivity of resources  
committed to maize and  
wheat in developing coun-  
tries, while protecting the  
environment.


**International Potato  
Center (CIP)**

[www.cgiar.org/cip](http://www.cgiar.org/cip)

**Headquarters:** Lima, Peru

**Director General:**

Hubert Zandstra

**Board Chair:** Adrian  
Fajardo-Christen (until  
February 28, 1998)

David MacKenzie (from  
March 1, 1998)

**Founded:** 1971

**Joined the CGIAR:** 1973

**Regional Offices:**

Cochabamba, Bolivia;  
Quito, Ecuador; Nairobi,  
Kenya; Bamenda,

Cameroon; Kampala,  
Uganda; Ibadan, Nigeria;  
Kafr El Zayat, Egypt; New  
Delhi, India; Bogor and  
Bandung, Indonesia;  
Manila, Philippines;  
Beijing, China.

**Focus:** To contribute to  
increased food produc-  
tion, the generation of  
sustainable and environ-  
mentally sensitive agricul-  
tural systems, and  
improved human welfare  
by conducting coordi-  
nated, multidisciplinary  
research programs on the  
potato and sweet potato.  
In pursuit of this goal, CIP  
conducts worldwide col-  
laborative research and  
training to catalyze col-  
laboration among coun-  
tries in solving common  
problems and help scien-  
tists worldwide success-  
fully address changing  
demands in agriculture.


**International Center for  
Agricultural Research In  
the Dry Areas (ICARDA)**

[www.cgiar.org/icarda](http://www.cgiar.org/icarda)

**Headquarters:** Aleppo,

Syrian Arab Republic

**Director General:**

Adel El-Beltagy

**Board Chair:**

Alfred Brönnimann

**Founded:** 1977

**Joined the CGIAR:** 1978

**Regional Offices:**

Damascus, Syrian Arab  
Republic; Beirut,  
Lebanon; Cairo, Egypt;  
Tunis, Tunisia; Rabat,  
Morocco; Amman,  
Jordan; Ankara, Turkey;  
Tehran, Iran; Dubai,  
United Arab Emirates;  
Dharmar, Republic of  
Yemen; Mexico City,  
Mexico.

**Focus:** To meet the chal-  
lenges posed by harsh  
and variable environments  
by increasing the produc-  
tivity of winter rainfed  
agricultural systems to  
higher sustainable levels,

by arresting and reversing soil degradation, by improving water use efficiency, and ensuring the quality of the fragile environmental resources. ICARDA has a worldwide responsibility for the improvement of barley, lentils, and faba bean, and a regional responsibility in West Asia and North Africa for the improvement of wheat, chickpea, forages, and pasture. ICARDA emphasizes rangeland improvement, small ruminant management and nutrition, and rainfed farming systems associated with these crops.



**International Center for Living Aquatic Resources Management (ICLARM)**

[www.cgiar.org/iclarm](http://www.cgiar.org/iclarm)

**Headquarters:** Makati City, The Philippines

**Director General:**

Meryl J. Williams

**Board Chair:**

Kurt J. Peters

**Founded:** 1977

**Joined the CGIAR:** 1992

**Regional Offices:** Honiara, Solomon Islands; Dhaka, Bangladesh; Zomba, Malawi; Tortola, British Virgin Islands; Giza, Egypt.

**Focus:** To improve the production and management of aquatic resources, for sustainable benefits to present and future generations of low-income producers and consumers in developing countries through international multidisciplinary research in partnership with national agricultural research systems. The declining state and threatened sustainability

of fisheries, resulting from overfishing, poverty, pollution, and the potential for increases in aquaculture production, call for research that explores the dynamics of coastal and coral reef resource systems and integrated agriculture-aquaculture systems, investigating alternative management schemes in these systems and improving the productivity of key species.



**International Centre for Research in Agroforestry (ICRAF)**

[www.cgiar.org/icraf](http://www.cgiar.org/icraf)

**Headquarters:**

Nairobi, Kenya

**Director General:**

Pedro Sanchez

**Board Chair:**

Yemi Katerere

**Founded:** 1977

**Joined the CGIAR:** 1991

**Regional Offices:**

Machakos, Kenya;

Yaoundé, Cameroon;

Bogor, Indonesia; Embu, Kenya; Zomba, Malawi; Bamako, Mali; Quintana Roo, Mexico; Niamey, Niger; Pucallpa, Peru; Laguna, Philippines; Shinyanga, Tanzania; Chiang Mai, Thailand; Kampala, Uganda; Chipata, Zambia; Harare, Zimbabwe.

**Focus:** To mitigate tropical deforestation, land depletion, and rural poverty through improved agro-forestry systems. Trees in farming systems can increase and diversify farmer income, make farming systems more robust, reverse land degradation, and reduce the pressure on natural forests. Working together with national agricultural and forestry research systems, non-governmental organizations, and other research partners, ICRAF carries out research and focuses on finding alternatives to slash-and-burn agriculture in the humid tropics and overcoming land depletion in sub-humid and semi-arid Africa.



**International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)**

[www.cgiar.org/icrisat](http://www.cgiar.org/icrisat)

**Headquarters:**

Patancheru, Andhra Pradesh, India

**Director General:**

Shawki Barghouti

**Board Chair:**

R. S. Paroda (until

January 31, 1998)

Ragnhild Sohlberg (from

February 1, 1998)

**Founded:** 1972

**Joined the CGIAR:** 1972

**Regional Offices:** Niamey,

Niger; Bamako, Mali;

Kano, Nigeria; Bulawayo,

Zimbabwe; Nairobi,

Kenya; Lilongwe, Malawi,

New Delhi, India.

**Focus:** To conduct research leading to enhanced sustainable food production in the harsh conditions of the semi-arid tropics. ICRISAT's main crops—sorghum, finger millet, pearl millet, chickpea, pigeonpea, and ground-

nut—are vital to life for the one-sixth of the world's population that lives in the semi-arid tropics. ICRISAT conducts research in partnership with the national agricultural systems that encompasses the management of the region's limited natural resources to increase the productivity, stability, and sustainability of these and other crops.



**International Food  
Policy Research Institute  
(IFPRI)**

[www.cgiar.org/ifpri](http://www.cgiar.org/ifpri)

**Headquarters:**

Washington, DC, United States of America

**Director General:**

Per Pinstrup-Andersen

**Board Chair:**

Martin Piñero

**Founded:** 1975

**Joined the CGIAR:** 1980

**Focus:** To identify and analyze alternative national and international strategies and policies for meeting the food needs of the developing world on a sustainable basis, with particular emphasis on low-income countries and on the poorer groups in those countries. While IFPRI's research is specifically geared to contributing to the reduction of hunger and malnutrition, the factors involved are many and wide-ranging,

requiring analysis of underlying processes and extending beyond a narrowly defined food sector. IFPRI collaborates with governments and private and public institutions worldwide and disseminates its research to policymakers, administrators, policy analysts, researchers, and others concerned with national and international food and agricultural policy.



**International Institute  
of Tropical Agriculture  
(IITA)**

[www.cgiar.org/iita](http://www.cgiar.org/iita)

**Headquarters:**

Ibadan, Nigeria

**Director General:**

Lukas Brader

**Board Chair:**

Enrico Porceddu

**Founded:** 1967

**Joined the CGIAR:** 1971

**Regional Offices:** Kano and Port Harcourt, Nigeria; Cotonou, Republique du Benin;

Yaoundé, Cameroon; Kumasi, Ghana; Bouaké, Côte d'Ivoire; Kampala, Uganda; Lilongwe, Malawi; Maputo, Mozambique; Manza, Zambia; Dar-Es-Salaam, Tanzania; Marondera, Zimbabwe.

**Focus:** To help those countries increase food production on an ecologically sustainable basis by conducting research and outreach activities with partner programs in the countries of Sub-Saharan Africa. IITA seeks to improve the food quality, plant health, and post-harvest processing of cassava, maize, cowpea, soybean, yam, and banana and plantain and strengthen national research capabilities.



**International Livestock  
Research Institute (ILRI)**

[www.cgiar.org/ilri](http://www.cgiar.org/ilri)

**Headquarters:**

Nairobi, Kenya

**Director General:**

Hank Fitzhugh

**Board Chair:** Neville Clark

**Founded:** 1995

**Joined the CGIAR:** 1995

**Regional Offices:** Addis Ababa, Ethiopia; Ibadan, Nigeria; Lima, Peru; Cali, Colombia; Niamey, Niger; Andhra Pradesh, India; Bobo-Dioulasso, Burkina Faso; Makati City, Philippines.

**Focus:** To increase animal health, nutrition, and productivity and protect environments supporting animal production by tailoring production systems and developing technologies that are sustainable over the long term. ILRI works to characterize and conserve the genetic diversity of indigenous tropical forage species and livestock

breeds and promote equitable and sustainable national policies for animal agriculture and related natural resource management.



**International Plant  
Genetic Resources  
Institute (IPGRI)**

[www.cgiar.org/ipgri](http://www.cgiar.org/ipgri)

**Headquarters:**

Rome, Italy

**Director General:**

Geoffrey Hawtin

**Board Chair:** Marcio de Miranda Santos

**Founded:** 1974

**Joined the CGIAR:** 1974

**Regional Offices:** Nairobi, Kenya; Serdang, Malaysia; Beijing, China; New Delhi, India; Aleppo, Syria; Cali, Colombia; Cotonou, Republique du Benin.

**IPGRI/INIBAP Offices:**

Montpellier, France; Heverlee, Belgium; Douala, Cameroon; Kampala, Uganda; Los Baños, Philippines;

Turrialba, Costa Rica; San Pedro Sula, Honduras  
**Focus:** To encourage, support, and engage in activities to strengthen the conservation and use of plant genetic resources worldwide, with special emphasis on developing countries, by providing scientific and technical information, research, and training.



**International Rice  
Research Institute (IRRI)**

[www.cgiar.org/irri](http://www.cgiar.org/irri)

**Headquarters:** Los

Baños, The Philippines

**Director General:**

Robert Havener (Interim Director General until August 30, 1998)

Ronald P. Cantrell (from September 1, 1998)

**Board Chair:**

Roelof Rabbinge

**Founded:** 1960

**Joined the CGIAR:** 1971

**Regional Offices:** Dhaka, Bangladesh; Yangon, Myanmar; New Delhi, India; Bogor, Indonesia; Bangkok, Thailand;



Ibaraki, Japan; Antananarivo, Madagascar; Vientiane and Luang Prabang, Lao PDR; Phnom Penh, Cambodia; Hanoi, Vietnam.

**Focus:** To improve the well-being of present and future generations of rice farmers and consumers, particularly those with low incomes, by generating and disseminating rice-related knowledge and technology of short- and long-term environmental, social, and economic benefit and by helping to enhance national rice research.



**International Service for National Agricultural Research (ISNAR)**

[www.cgiar.org/isnar](http://www.cgiar.org/isnar)

**Headquarters:** The Hague, The Netherlands

**Director General:** Stein Bie

**Board Chair:**

Amir Muhammed

**Founded:** 1979

**Joined the CGIAR:** 1980

**Focus:** To help developing countries bring about

sustained improvements in the performance of their national agricultural research systems and organizations by supporting institutional development, promoting appropriate policies and funding for agricultural research, developing or adapting improved research management techniques, and generating and disseminating relevant knowledge and information.



**International Water Management Institute (IWMI)**

[www.cgiar.org/iimi](http://www.cgiar.org/iimi)

**Headquarters:**

Colombo, Sri Lanka

**Director General:**

David Seckler

**Board Chair:** Zafar Altaf

Co-Chair: Klaas Jan Beek (as of December 22, 1998)

**Founded:** 1984

**Joined the CGIAR:** 1991

**Regional Offices:** Battaramulla, Sri Lanka; Ouagadougou, Burkina Faso; Mexico City, Mexico;

Niamey, Niger; Lahore, Pakistan; Izmir, Turkey.

**Focus:** To foster improvement in the management of water resource systems and irrigated agriculture. IWMI conducts a worldwide program to generate knowledge to improve water resource systems and irrigation management, strengthen national research capacity, and support the introduction of improved technologies, policies, and management approaches.



**West Africa Rice Development Association (WARDA)**

[www.cgiar.org/warda](http://www.cgiar.org/warda)

**Headquarters:**

Bouaké, Côte d'Ivoire

**Director General:**

Kanayo Nwanze

**Board Chair:**

Just Faaland

**Founded:** 1970

**Joined the CGIAR:** 1975

**Regional Offices:** Abidjan, Côte d'Ivoire; St. Louis, Senegal; Ibadan, Nigeria.

**Focus:** To strengthen the capability of agricultural scientists in West Africa to generate technology for the sustainable productivity of intensified rice-based cropping systems to improve the well-being of poor farm families and conserve and enhance the natural resource base. Research focuses on rice grown in mangrove swamps, inland valleys, upland conditions, and irrigated conditions.

## CGIAR Inter-Center Programs

Alternatives to Slash and Burn Agriculture

CGIAR Gender and Diversity Program

Desert Margins Program

Ecoregional Program for Humid and Sub-Humid Areas

Ecoregional Program for Tropical Latin America

Farmer Participatory Research and Gender Analysis

Future Harvest—Science for Food, the Environment, and the World's Poor

Integrated Voice and Data Network

International Crop Information System

Program for the Humid Tropics and Inland Valley Areas

Program for Sustainable Agriculture in Mountainous Areas

Rice-Wheat Consortium for the Indo-Gangetic Plains

Soil, Water and Nutrient Management Program

Systemwide Genetic Resources Programme

Systemwide Initiative on Water Management

Systemwide Information Network on Genetic Resources

Systemwide Livestock Programme

Systemwide Program on Integrated Pest Management

Systemwide Program on Property Rights and Collective Action

## Who's Who in the CGIAR

### CGIAR Members

#### Countries

Australia, Austria, Bangladesh, Belgium, Brazil, Canada, China, Colombia, Côte d'Ivoire, Denmark, Egypt, Finland, France, Germany, India, Indonesia, Iran, Ireland, Italy, Japan, Kenya, Korea, Luxembourg, Mexico, Netherlands, New Zealand, Nigeria, Norway, Pakistan, Peru, Philippines, Portugal, Romania, Russian Federation, South Africa, Spain, Sweden, Switzerland, Syrian Arab Republic, Thailand, Uganda, United Kingdom, United States of America

#### Foundations

Ford Foundation  
Kellogg Foundation  
Rockefeller Foundation

### International and Regional Organizations

African Development Bank, Arab Fund for Economic and Social Development, Asian Development Bank, Commission of the European Community, Food and Agriculture Organization of the United Nations, Inter-American Development Bank, International Development Research Centre, International Fund

for Agricultural Development, OPEC Fund for International Development, United Nations Development Programme, United Nations Environment Programme, World Bank

### CGIAR Regional Representatives

Burkina Faso and Zimbabwe, Malaysia and Nepal, Estonia and Slovenia, Nicaragua and Paraguay, Egypt and Syrian Arab Republic

### The CGIAR

#### Chairman

Ismail Serageldin, *Vice President, Special Programs, The World Bank*

#### Executive Secretary

Alexander von der Osten

### Cosponsors and Their Representatives

Food and Agriculture Organization of the United Nations, Henri Carsalade; United Nations Development Programme, Roberto L. Lenton; United Nations Environment Programme, Till Darnhofer; The World Bank, Alexander F. McCalla

### Standing Committees

#### CGIAR Oversight Committee<sup>1</sup>

Andrew J. Bennett, *Chair, United Kingdom*  
Mervat W. El Badawi, *Arab Fund*  
William D. Dar, *Philippines*  
Teresa Fogelberg, *The Netherlands*  
John Van D. Lewis, *United States*

#### CGIAR Finance Committee<sup>2</sup>

The World Bank, Chair (Michel Petit)  
Egypt, (Robert Clements/Ian Bevege)  
Canada, (Carolyn McAskie/Iain C. MacGillivray)  
Europe, (Saad Nassar)  
European Commission, (Uwe Werblow/Nikolaos Christoforides)  
Germany, (Hans-Jochen de Haas)  
IFAD, (Abdelmajid Slama/S. Mathur)  
India, (R. S. Paroda)  
Japan, (Takuji Hanatani/Yasuhiro Mitsui)  
Sweden, (Carl-Gustaf Thornström)

### Advisory Committees

#### Technical Advisory Committee (TAC)<sup>3</sup>

Donald L. Winkelman, *Chair*  
Shellemiah O. Keya, *Executive Secretary*  
Michael Cernea  
Jacques Faye

Elias Fereres  
Richard R. Harwood  
Alain de Janvry  
Keiji Kainuma  
Magdy A. Madkour  
Maria Antonia Fernandez Martinez  
Cyrus G. Ndiritu  
Lucia de Vaccaro  
Usha Barwale Zehr

### Impact Assessment Evaluation Group (IAEG)<sup>4</sup>

W. James Peacock, *Chair*  
Guido Gryseels, *Executive Secretary*  
Cristina C. David  
Hans M. Gregersen  
Frans L. Leeuw

### Genetic Resources Policy Committee

M. S. Swaminathan, *Chair*  
Bo M. Bengtsson  
Jürg Benz  
Robert Bertram  
Adel El-Beltagy  
Geoffrey C. Hawtin  
Norah K. Olembo  
Setijati Sastrapradja  
Maria José de Oliveira Zimmermann

### NGO Committees<sup>5</sup>

Miguel A. Altieri, *Chair*  
Bernd V. Dreesmann  
Yuxin Du  
Julian Francis Gonsalves  
Assétou Kanouté  
Jeffrey A. McNeely  
Jeanot Minla Mfou'ou  
Carmen Felipe-Morales  
Carlos A. Perez  
Didier Pillot

Ranil Senanayake  
Christian Castellanet  
Jean Marc von der Weid  
Dwi R. Muhtaman

### Private Sector Committee

R. N. Sam Dryden, *Chair*  
Assia Bensalah Alaoui, *Vice Chair*  
Pramod K. Agrawal  
Carol Mallette Amaratunga  
Bernard P. Auxenfans  
Wallace D. Beversdorf  
Mohamad Adel El-Ghandour  
Alejandro Rodriguez-Graue  
Dinguri Nick Mwaniki  
John M. Preston  
Alberto U. Rubinstein  
Seizo Sumida

### CGIAR 1971–1998

#### Chairmen, 1971–1998

Ismail Serageldin, 1994–  
V. Rajagopalan, 1991–1993  
Wilfried Thalwitz, 1990–1991  
W. David Hopper, 1987–1990  
S. Shahid Hussain, 1984–1987  
Warren Baum, 1974–1983  
Richard H. Demuth, 1971–1974

### Executive Secretaries, 1972–1998

Alexander von der Osten, 1989–  
Curtis Farrar, 1982–1989  
Michael Lejeune, 1975–1982  
Harold Graves, 1972–1975

### TAC Chairs, 1971–1998

Donald Winkelman, 1994–  
Alex McCalla, 1988–1994  
Guy Camus, 1982–1987  
Ralph Cummings, 1977–1982  
Sir John Crawford, 1971–1976

### TAC Executive

#### Secretaries, 1971–1998

Shellemiah Keya, 1996–  
Guido Gryseels, 1995–1996  
John Monyo, 1985–1994  
Alexander von der Osten, 1982–1985  
Philippe Mahler, 1976–1982  
Peter Oram, 1971–1976

#### Notes

<sup>1</sup> Luis Fernando Chaparro Osorio departed Oversight Committee in October 1998.

<sup>2</sup> Derek Eaton departed Finance Committee in August 1998; Michel J. Petit's term expired at the end of 1998.

<sup>3</sup> Justin Y. Lin departed TAC in September 1998; Jacques Faye's term expired at the end of 1998.

<sup>4</sup> C. Peter Timmer departed IAEG in May 1998, Peter Matlon (acting Executive Secretary) departed in September 1998, and W. James Peacock's term expired at the end of 1998.

<sup>5</sup> Kamla Chowdhry departed NGO Committee in October 1998; the following members' terms expired at the end of 1998: Jeffrey A. McNeely, Jeanot Minla Mfou'ou, Didier Pillot, and Ranil Senanayake.





The image features a solid blue background. On the right side, there are several concentric, slightly irregular ripples, resembling water droplets or a stone thrown into a pond. The ripples are darker blue than the background, creating a sense of depth and movement. The overall composition is minimalist and serene.

[www.cgiar.org](http://www.cgiar.org)